

CHAPTER 13

WEAPONS ASSEMBLY

Weapons assembly must be done with care and safety; the procedures in this chapter are typical assembly requirements. These procedures do not include authorization for flight or tactical doctrine.

WEAPONS ASSEMBLY PROCEDURES

LEARNING OBJECTIVE: *Identify the purpose of conventional weapons assembly to include a description of general-purpose bombs and support equipment configurations. Identify common procedures to follow when assembling conventional weapons. Recognize the bomb assembly area arrangement.*

In the following paragraphs, you will read about the assembly procedures for some of the most commonly used weapons. This TRAMAN doesn't include assembly procedures for every available weapon in the Navy. However, the following procedures give you basic information about assembly procedures. Remember, regardless of how well trained an assembly crew may be, there must always be a crew leader and a quality assurance/safety observer (QA/SO). The crew leader is required to use a weapons assembly checklist or manual during all phases of the weapon assembly process. The QA/SO inspects each completed round to ensure it is correctly assembled and installed on the handling equipment.

NOTE: For detailed information on Mk 80 (series) bomb assembly/disassembly, support equipment requirements, and procedures for preloading/downloading accessory suspension equipment, you should refer to the *Airborne Weapons Assembly Manual*, NAVAIR 11-140-5.

AIRCRAFT GENERAL-PURPOSE BOMBS

Aircraft general-purpose bombs are assembled in a variety of configurations. Mission requirements dictate the way a weapon is to be configured. This information is found in the ordnance load plan. A few of these

configurations are discussed in the following paragraphs.

Bomb Assembly Tools and Equipment Requirements

Tools and equipment listed in table 13-1 are required for weapons assembly evolutions. The list is provided to assist personnel in proper assembly procedures.

Bomb Assembly Crew

Bomb assembly is usually done on the fourth or fifth deck of an aircraft carrier or flight deck or hangar deck on LFORM class ships. They can also be built on the second deck (mess deck) or other designated areas of aircraft carriers. The reference to positions used with the bomb assembly crew as used here are for ease of understanding only. Many personnel operate the bomb assembly stand (fig. 13-1) and support the assembly evolution. The crew positions are:

- Supervisor
- QA/SO
- Hoist operators
- Nose fuze/TDD installer
- Tail fuze installer
- Tail fin installer
- Skid and hoist operator
- Forklift operator
- Dunnage personnel
- Elevator operators

Preparation For Use

When you use GP bombs, the following preparations must be carried out. As you read this section, refer to figures 13-2 through 13-5.

Table 13-1.—Bomb Assembly Tool Requirements

BOMB ASSEMBLY TOOL/EQUIPMENT REQUIREMENTS	
Spanner wrenches (spreader type)	2 each
Apex tip holders (with setscrew) 3/8" drive	4 each
Apex tip for 500 lb bomb conical fins	2 each
Apex tip for 1000 lb bomb conical fins	2 each
Apex tip for 500 lb retarding fin	2 each
Apex tip for nose setscrew 3/16"	2 each
Apex tip for butt plate removal	2 each
1/2" drive speed handle	2 each
3/8" drive speed handle	3 each
Needle nose pliers	2 each
6" Straight slot screwdriver, 1/4" blade	2 each
8" Straight slot screwdriver, 3/8" blade	2 each
Phillips screwdriver 8" No. 2	2 each
Band cutters	1 each
Full face shields	2 each
Heavy duty work gloves	2 pair
Wire cutters (diagonal wire cutting)	2 each
Wooden dowel	2 each
Nonsparking wire brush	2 each
Local manufactured bar for rolling bombs	1 each
Allen wrench sets	2 each
1/8" Allen wrench	2 each
Explosionproof flashlight	3 each
Sway brace/lug gauge GMU-74/E	2 each
Nutdriver 3/8" for fuze restraining clip (nutdrivers are enclosed with case of clips)	2 each
Closure ring wrench P/N 1379AS503 3/8" drive ratchet	2 each
IMER/ITER RACKING - STATIONS TOOL REQUIREMENTS	
15/16" open end wrench	3 each
7/16" open end wrench	3 each
5/8" open end wrench	3 each
7/16" socket 3/8" drive	3 each
3/8" drive ratchet	3 each
Needle nose pliers	3 each
Wire cutters (dykes)	2 each
6" straight slot screwdriver	3 each
Sway brace/lug gauge GMU-74/E	2 each
IMER/ITER rack unlocking tool (manufactured locally)	3 each
Tool pouches	As required

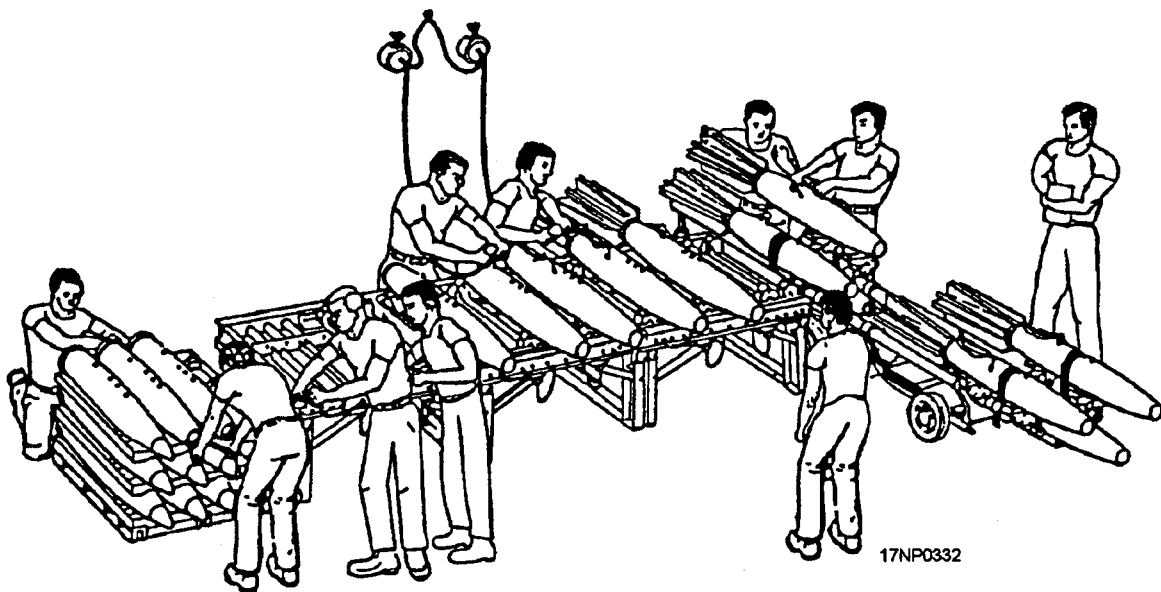


Figure 13-1.—Typical bomb assembly crew positions.

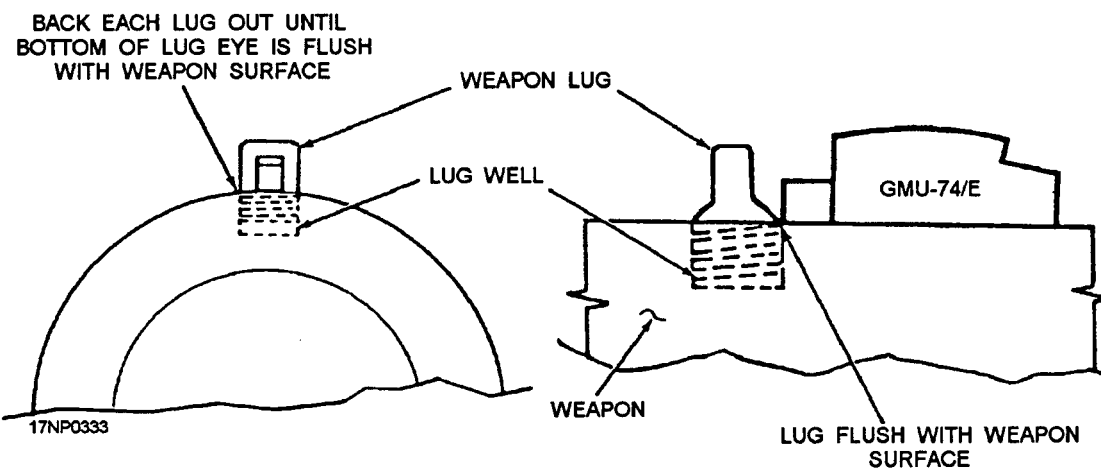


Figure 13-2.—Weapon lug thread engagement.

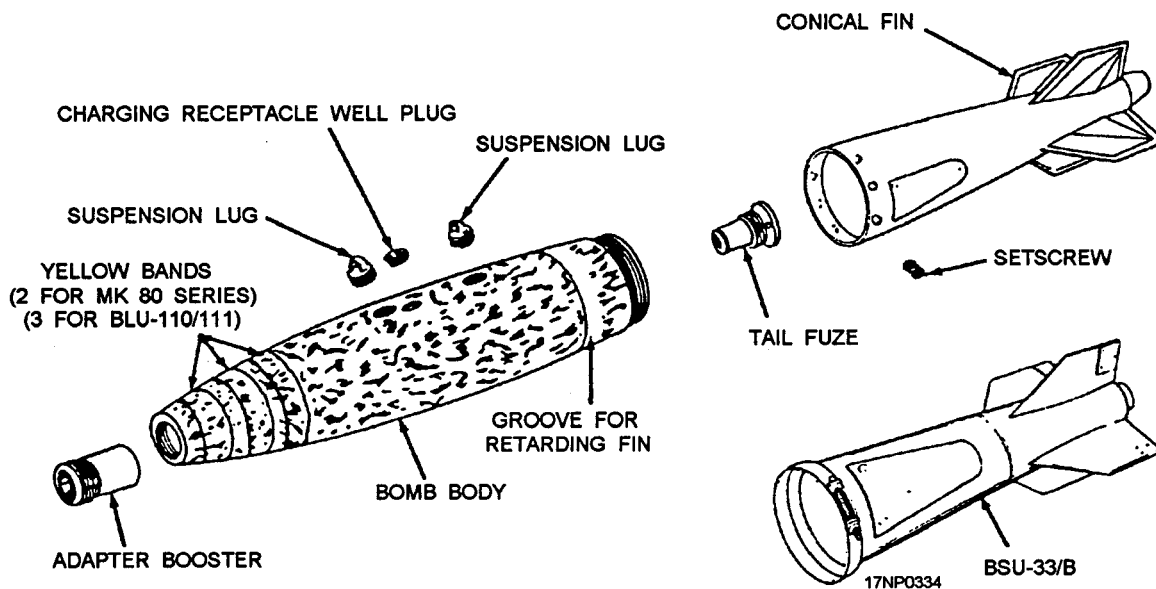


Figure 13-3.—General-purpose bomb components.

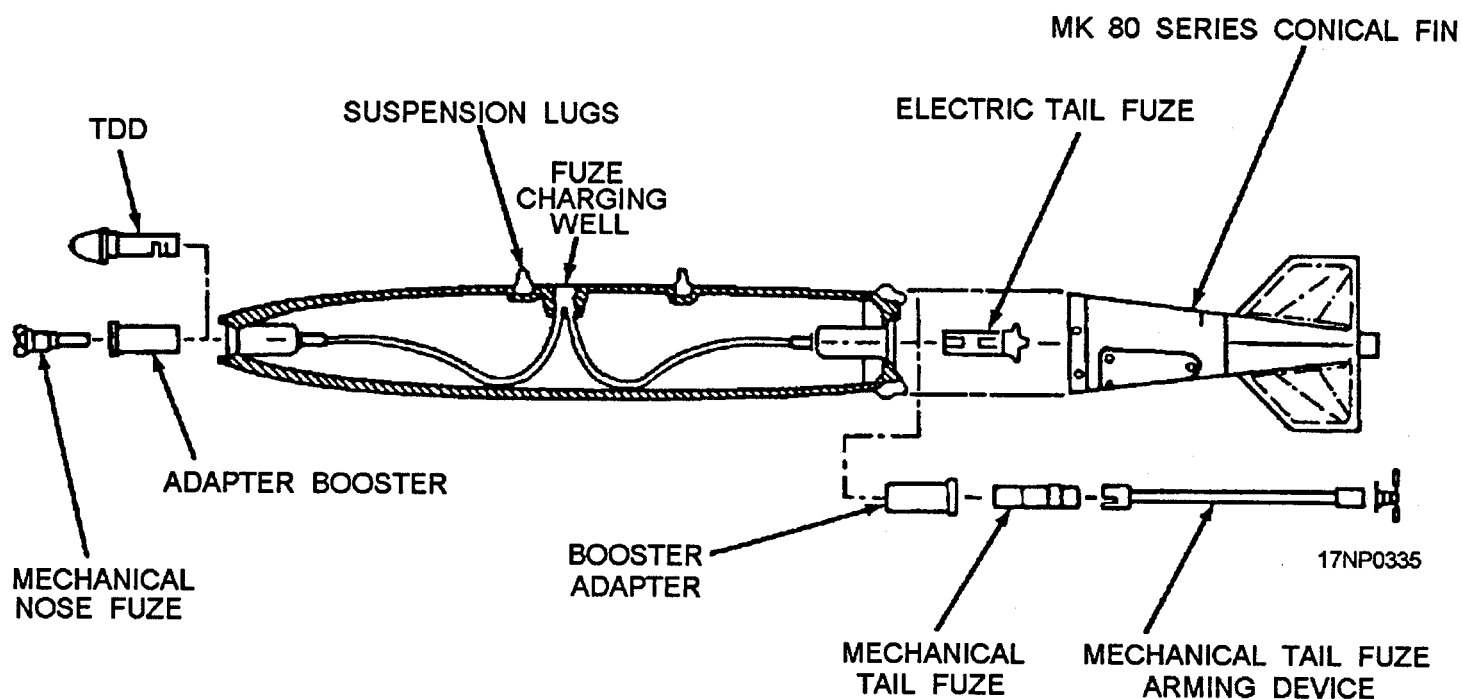


Figure 13-4.—Bomb breakdown.

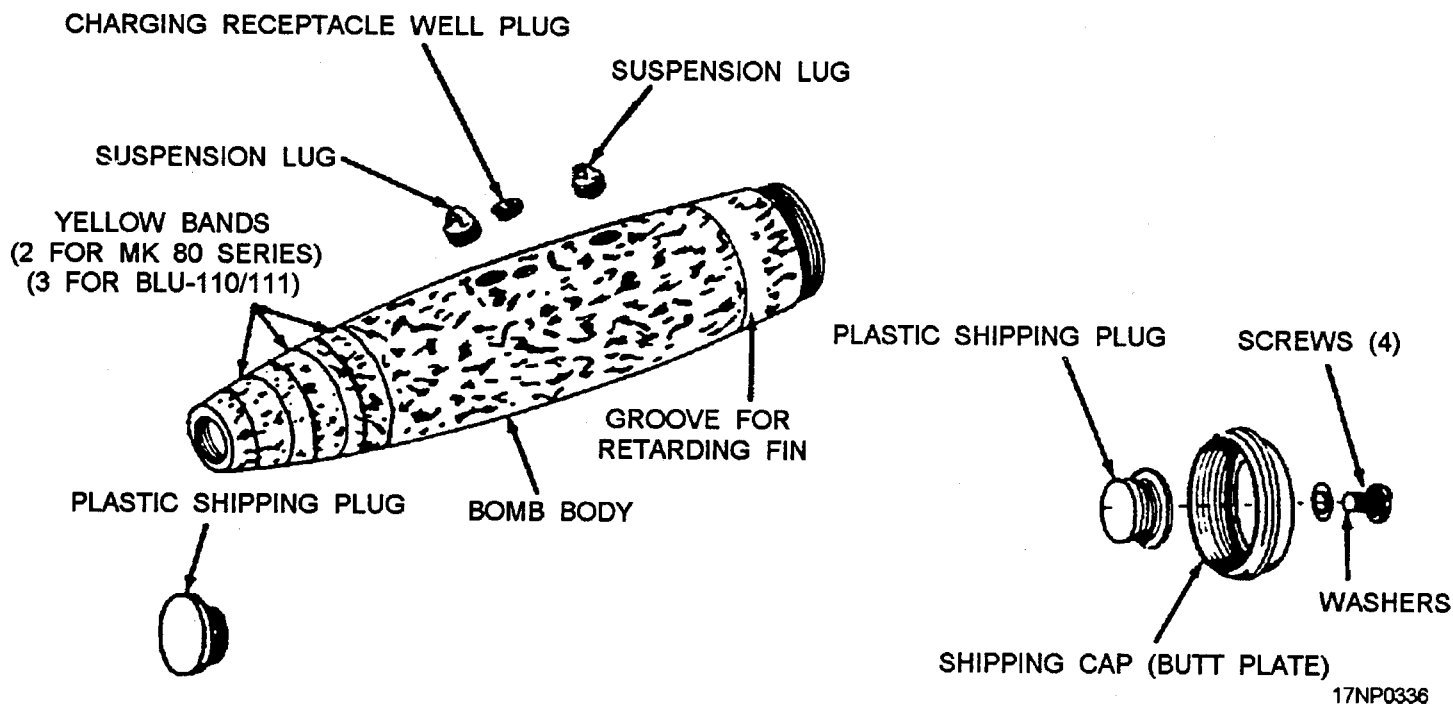


Figure 13-5.—General-purpose bomb shipping configuration.

BREAKOUT.— *Breakout* is the term used to define the physical removal of ammunition from the magazine. Weapons are broken out, by direction of the ordnance handling officer (OHO), in accordance with the load plan. When ordnance breakout is directed by the OHO, the breakout crew records the type, lot number, and quantity of ordnance broken out. Then, the crew passes this information back to ordnance control so that an accurate account and location of weapons and related material on board can be kept up to date.

UNPACKING.— You must depalletize the bomb body and place it on the appropriate bomb skid or assembly stand. Prior to depalletizing, ensure that gloves, steel toe shoes, and face shields are worn. When depalletizing a bomb body, you need to remove the banding straps and the top section of the metal pallet, the shipping cap on the rear of the bomb body, and all plastic shipping plugs from the fuze cavities. Then, install hoisting bars, as necessary, for manual handling of the bombs. Other suitable hoisting equipment may be used when available. Finally, place the bomb on the appropriate bomb skid or assembly stand.

INSPECTION.— You need to inspect the bomb for damage, stripped threads, cracks, or broken welds. Make sure the bottoms of the suspension lug eyes are flush with the weapon surface. Check to see that the bomb's V-groove is clean and undamaged. Check the fuze wells to ensure they are clean and dry. If nose elements and/or electric tail fuzes are to be used, check the electrical connectors to ensure they are not bent or corroded. Press gently with a wooden dowel on the connectors to ensure that they are firmly seated. Inspect thermally protected bombs for loose or chipped coating. Bombs that are missing more than 15 square inches of thermal coating in one spot are not considered thermally protected and are restricted from issue to aircraft carriers. Damaged or otherwise unserviceable bombs should be disposed of by following current directives.

Adapter Boosters

Install adapter boosters by using the procedures discussed in the following text.

WARNING

Fuzing for the thermally protected GP/TP bomb to obtain cook-off protection is limited to Fuze M904E4 with thermally protected adapter-booster M148E1, electric fuzes FMU-139, Mk 376, and Mk 346 with thermal shield. Any other fuzing greatly increases the probability of early detonation of a bomb engulfed in a fire.

INSTALLATION OF ADAPTER BOOSTERS.— Remove the adapter booster from the shipping container. If a mechanical nose fuzing is used, install an M148 adapter booster. If you use a mechanical tail fuze, install the M150/T46 adapter booster with the booster cup.

NOTE: In addition to the booster cup, the M150 and T46 adapter booster consists of two separate explosive components. The primary adapter booster contains a 2.0-inch diameter tail fuze. The T46 (series) contains a fuze adapter sleeve for use with 1.5-inch diameter fuzes.

MECHANICAL NOSE FUZING.— When you use mechanical nose fuzing, an M148 adapter booster is installed as follows:

1. Unpack the adapter booster and remove the closing plug.
2. Inspect the adapter booster internally and externally to ensure all parts, including threads, are clean and undamaged
3. Inspect the bomb nose fuze cavity.
4. Loosen the setscrew in the bomb body.
5. Screw the adapter booster into the bomb, and tighten it with a spanner wrench until it is firmly seated
6. Tighten the setscrew in the bomb body against the adapter-booster threads.

Installation of Electric and Electronic Tail Fuzes

The Mk 376/FMU-139 series electric and electronic tail fuzes are currently being used in the Navy. The following are general procedures you should

follow when working with these fuzes. Refer to figure 13-6 for arming wire installation.

MK 376 ELECTRIC TAIL FUZE.— Prepare, inspect, and install the fuze as follows:

1. Ensure that the safety pin is installed in the pop-out pin.
2. Remove shipping cap.
3. Ensure moisture or foreign material is not present in the electrical connector at base of fuze.
4. With thumb, push in on pop-out pin, remove safety pin from pop-out pin.
5. Ascertain if resistance from pop-out pin against thumb is present.
6. Reinstall safety pin into pop-out pin.
7. Loosely install fuze restraining clip on the flange of the fuze.
8. Install fuze into tail fuze well, and tighten with spanner wrench until flange is seated.
9. Align pop-out vertical with bomb lugs; tighten fuze restraining clip.

FMU-139 ELECTRONIC TAIL FUZE.— Prepare, inspect, and install the fuze as follows:

1. Ensure that gagrod is secured by safety pin.
2. Verify that red and black striping is not visible on gagrod sleeve.
3. Check fuze for exterior damage, moisture, and corrosion.
4. Remove plastic shipping plug and flag from connector on the end of the fuze.
5. Set the fuze switches as follows:
 - a. Check that the low-drag arm/delay fire switch is set to X-position.
 - b. Rotate high drag arm/delay time switch as required. It must be in a 2.6 sec position for Navy/Marine aircraft.
6. Align faceplate with bomb lugs. Insert fuze into tail fuze well.
7. Install and tighten closure ring. The fuze may spin slightly.

Mk 122 Arming Safety Switch

Remove, inspect, and install the Mk 122 arming safety switch as follows:

1. Remove the Mk 122 arming safety switch from its package.

2. Inspect the Mk 122 arming safety switch for deformation, corrosion, and damage to the case. Check the contact assembly for cleanliness. Check the coaxial cable for cracks and breaks in the insulation, and be careful not to stress the coaxial cable.

3. Install the Mk 122 safety arming switch as follows:

WARNING

The Mk 122 arming safety switch must be installed in a RADHAZ-free environment. Do not pull the lanyard during handling and loading. If the lanyard breaks away from the switch, discard the entire arming safety switch so it will not be used on a bomb. Do not attempt to replace the lanyard.

CAUTION

When installing or removing the weapons carrier and while handling the weapon, be particularly careful to avoid damaging the safety switch. When using a Mk 49 Mod 1 weapons carrier, do not install the safety switch until the weapon has been positioned on the skid adapter. Failure to orient the switching unit retaining nut can result in damage to the arming safety switch.

a. Plug the male connector of the switching unit firmly into the bomb charging receptacle, piercing the diaphragm. Then, slide the switching unit retaining nut, threads down, over the cable and lanyard.

b. Secure the arming safety switch in the bomb charging receptacle by screwing the switching unit retaining nut into the bomb and tightening it with the wrench supplied. When the nut is seated on the top of the switching unit, back it off until the flattened sides of the switching unit retaining nut are at right angles to the length of the bomb and the coaxial cable is aft of the lanyard.

c. Insert the free end of the cable through the nearest bomb suspension lug to safeguard the cable.

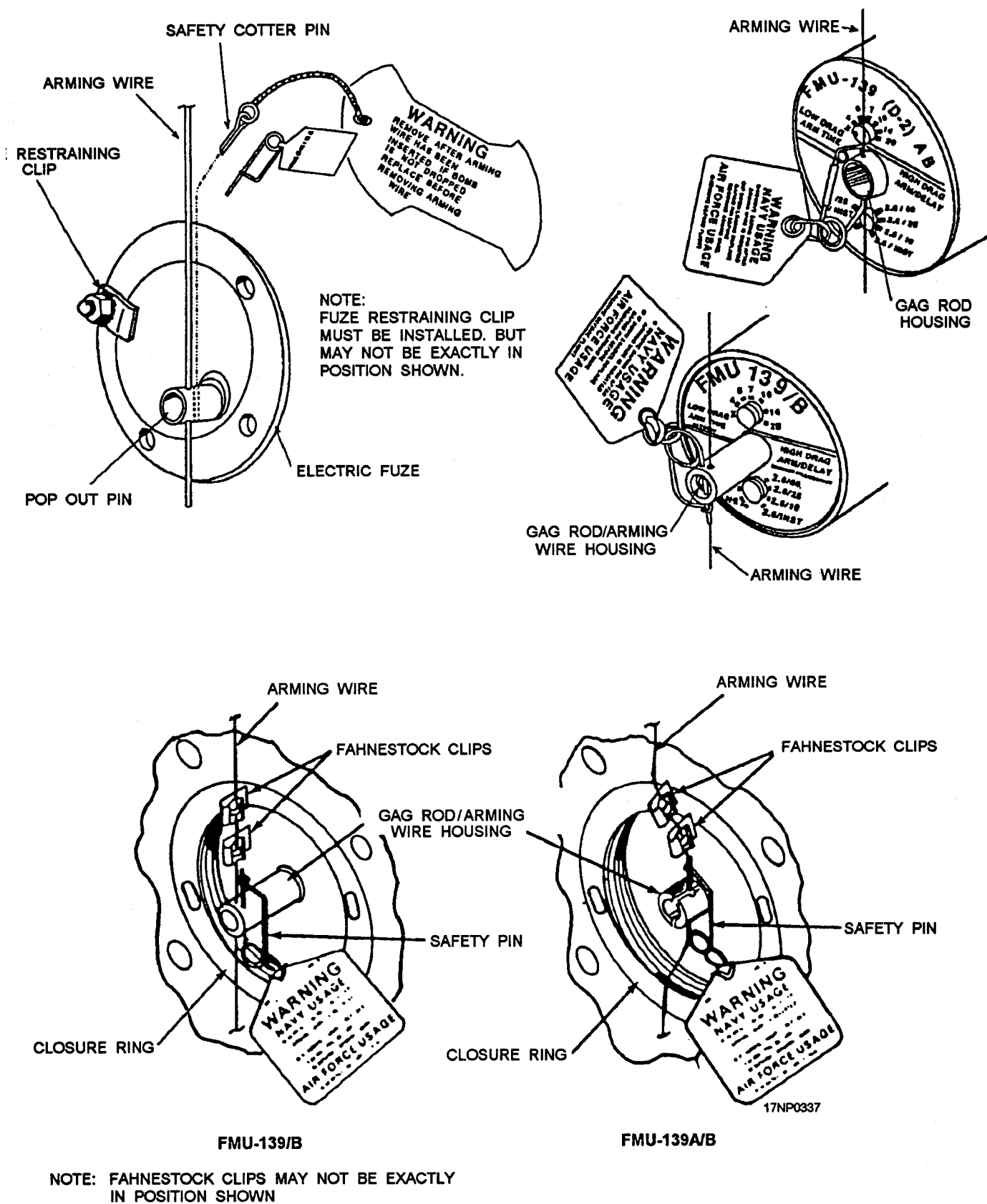


Figure 13-6.—Mk 376 and FMU-139 series electric/electronic fuze arming wire installation.

Assembly of Conical Fin to the Bomb Body

Prepare, inspect, and install a conical fin as follows (fig. 13-7):

1. Inspect fin for damage.
2. Ensure excess paint is removed from fin flange.
3. Ensure access cover is secure.
4. For a conical fin, retract all fin mounting setserews until screws are flush with the inside of the fin flange (all setscrews must be installed).
5. For a BSU-33 fin, ensure the clamp bolt on the band is retracted.
6. Ensure index pin in fin flange is not damaged.

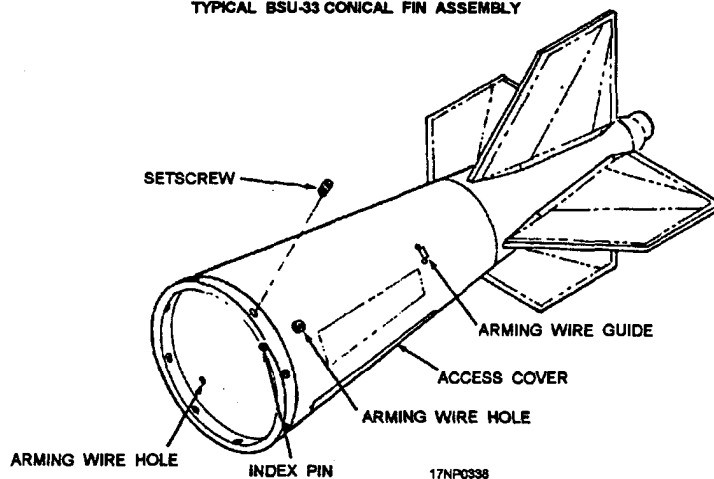
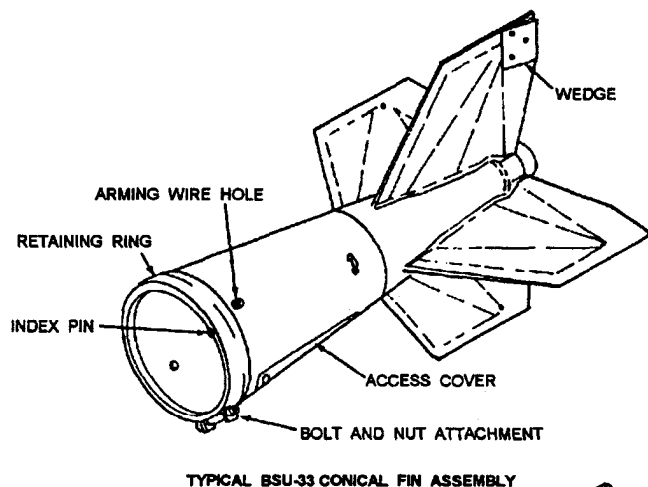


Figure 13-7.—BSU-33 series and MAU-93/B conical fins.

7. Attach the arming wire to the aft lug (fig. 13-8). Thread the free end of Mk 3 arming wire from aft bomb lug through MAU-182 swivel ring and arming wire hole in top of fin.

8. Align fin behind bomb body with fin in the X-configuration.

9. Align pop-out pin with arming wire hole in top of fin.

10. Thread arming wire through the hole in top of the fin, and then through the fuze pop-out pin (fig. 13-6) and through the hole in bottom of fin (Mk 376).

11. Remove safety pin from pop-out pin (Mk 376).

12. Thread arming wire through two Fahnstock clips, gagrod, (fig. 13-6) and through the bottom of the fin (FMU-139/B).

13. Thread arming wire through two Fahnstock clips and the bottom of the fin, vertically align arming wire with arming wire slots located on gagrod arming wire housing (FMU-139A/B, B/B).

14. Push arming wire into arming wire housing.

15. Remove safety pin from gagrod.

Assembly of BSU-86 and BSU-85 Fins to GP Bombs

Inspect the BSU-86 fin (fig. 13-9) as follows:

1. Inspect fin for damage and improperly installed or missing parts and corrosion.
2. Ensure that the restraining band is free of corrosion. If damage is found or suspected, complete steps 3 through 7; if no damage, proceed to step 8.
3. Remove cotter pin from fin latch; ensure latch opens freely.

NOTE: If fins extend automatically at least 1/2 inch when the cotter pin is removed, and can be extended to contact the shock absorber by hand, the fin is operative.

4. Check that link pins and link pin retainers are present, not damaged, and properly positioned in the drag links.

5. Close fins and clamp together with vise grip pliers.

6. Relatch the release band, and insert warning tag assembly.

7. Remove vise grip pliers.

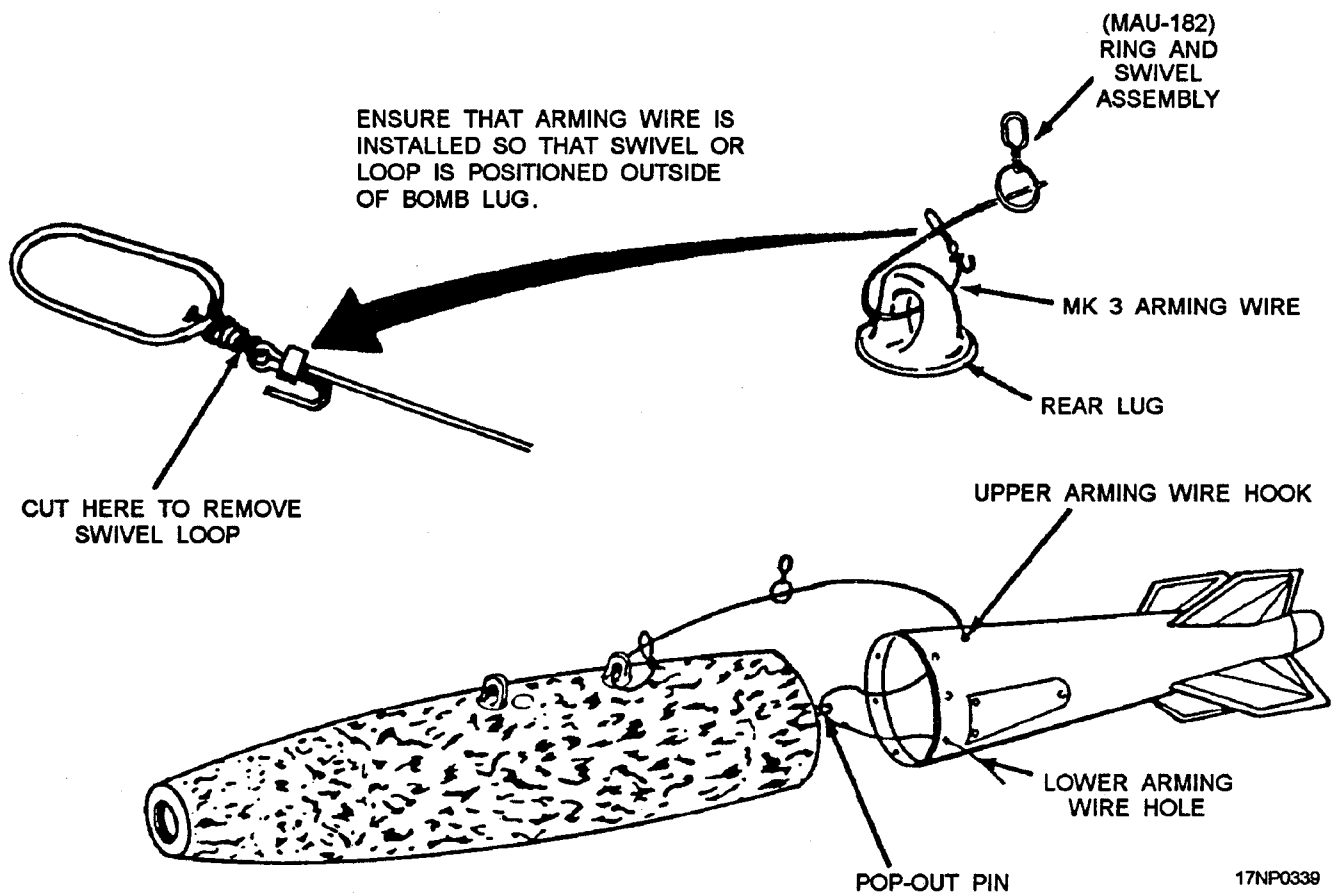


Figure 13-8.—Conical and BSU-33 series fin installation.

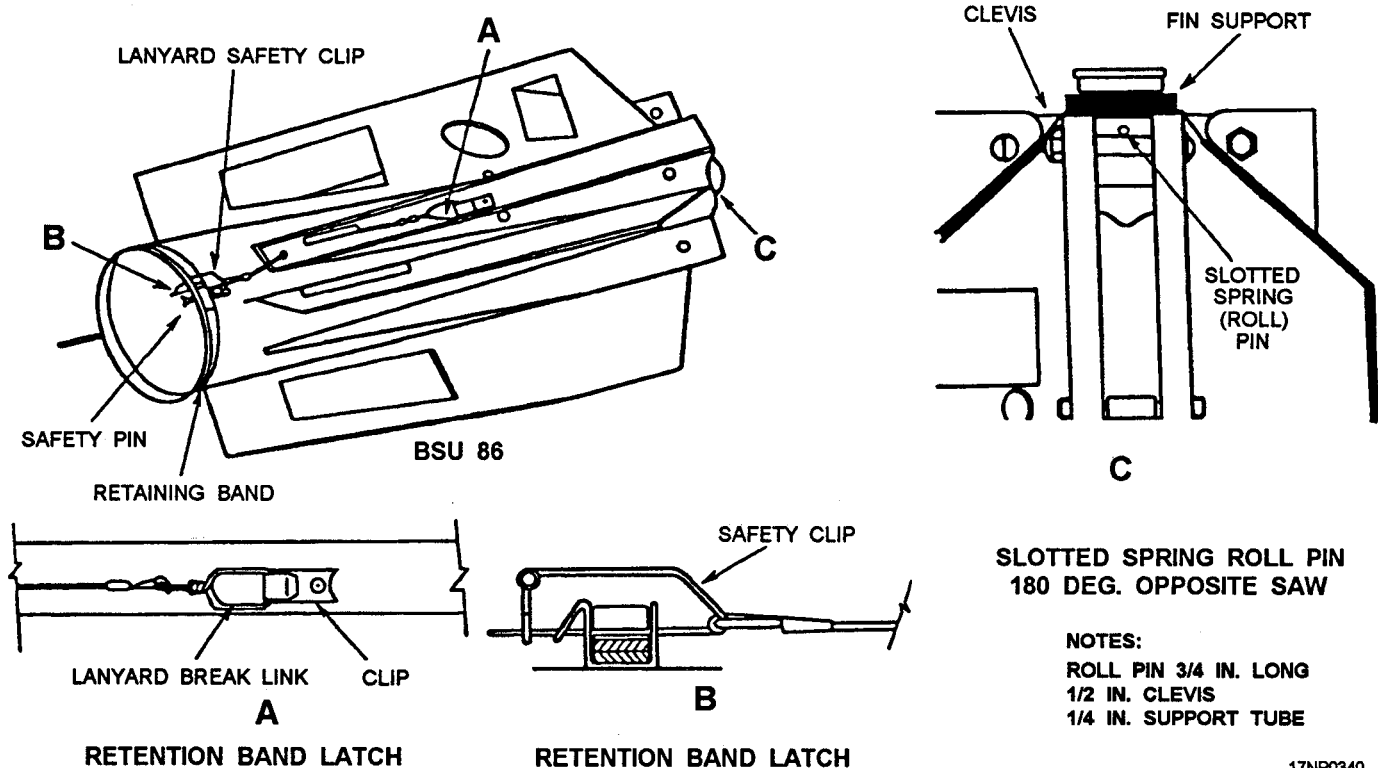
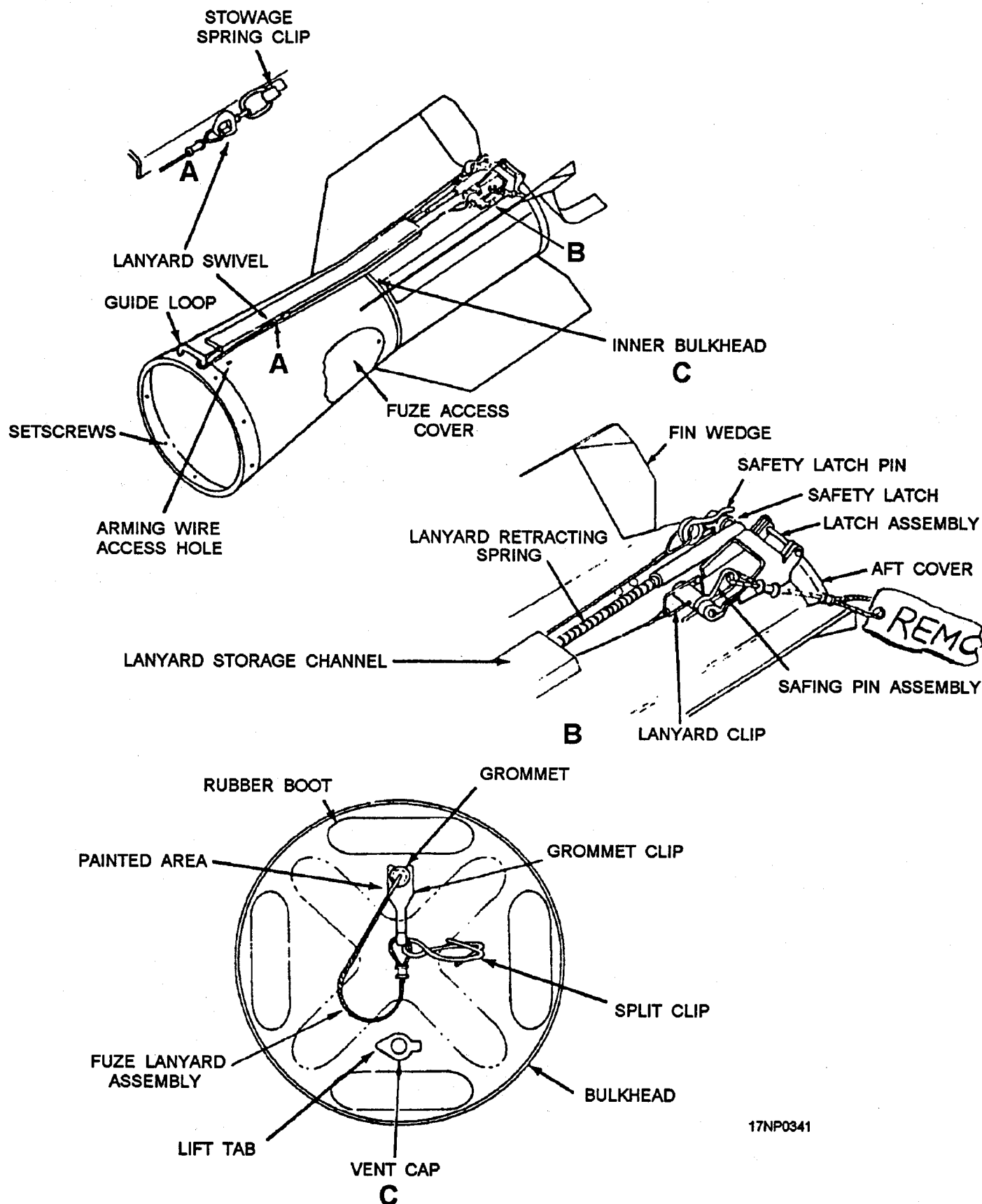


Figure 13-9.—BSU-86 bomb fin.



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Figure 13-10.—BSU-85/B air-inflatable, retardable fin.

8. Ensure band, retainer, and release assembly are not damaged.

9. Ensure the lanyard swivel is installed on stowage.

10. Ensure the release lanyard and housing and the safety clip are not damaged.

11. Ensure the slotted spring (roll pin) is installed and is properly seated and not protruding from the clevis.

Inspect the BSU-85/B fin (fig. 13-10) as follows:

1. Ensure safing pin assembly, safety latch pin, and lanyard clip are properly installed

2. Ensure all setscrews are installed and flush with inside surface of the forward ring.

3. Viewing the retarder from the open attachment end, check that the rubber boots are secure and not damaged (fig. 13-10).

4. Open the pressure vent cap, ensure the nose fuze lanyard assembly is not damaged, and that the lanyard swivel assembly is attached to the stowage spring clip (fig. 13-10).

5. Ensure the safety latch is installed over the aft cover tang, the release latch pivot pin is not damaged, and the cotter pin is installed (fig. 13-10).

6. Ensure access cover is installed.

Installation of BSU-86 and BSU-85/B Fins

Install the BSU-86 and BSU-85/B fin assemblies to GP bombs as follows:

1. Attach arming wire to aft lug (fig. 13-11). Thread free end of Mk 3 arming wire from aft bomb lug through MAU-182 swivel ring and arming wire hole in top of fin.

2. Align fin behind bomb body with fin in the X-configuration.

3. Align pop-out pin or gagrod housing with arming wire holes in top of fin.

4. Align index pin with hole in bomb body, and press fin against bomb body.

5. Tighten all setscrews into groove in bomb.

6. On the BSU-85/B, remove access cover, and inspect arming wire. Alternately pull wire from top and bottom of retarder.

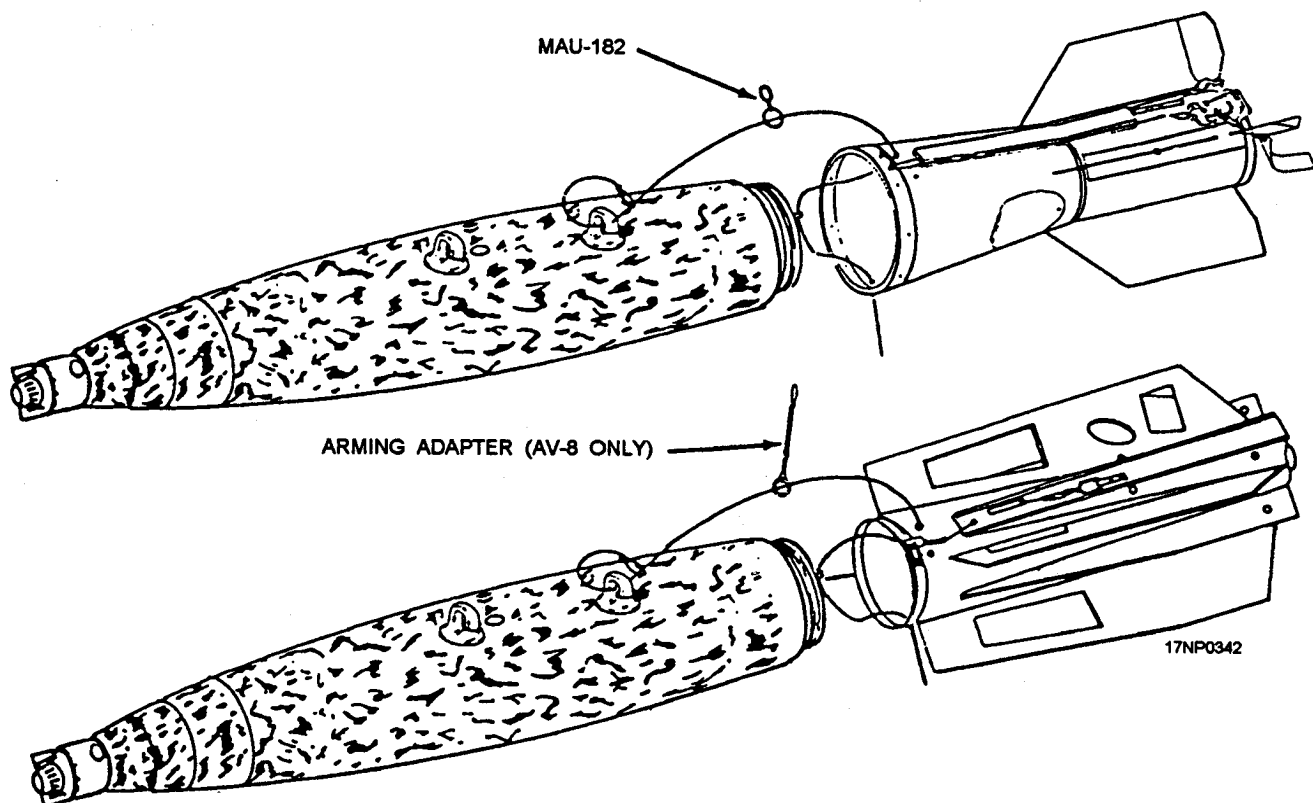


Figure 13-11.—Mk 3 arming wire and swivel loop installation.

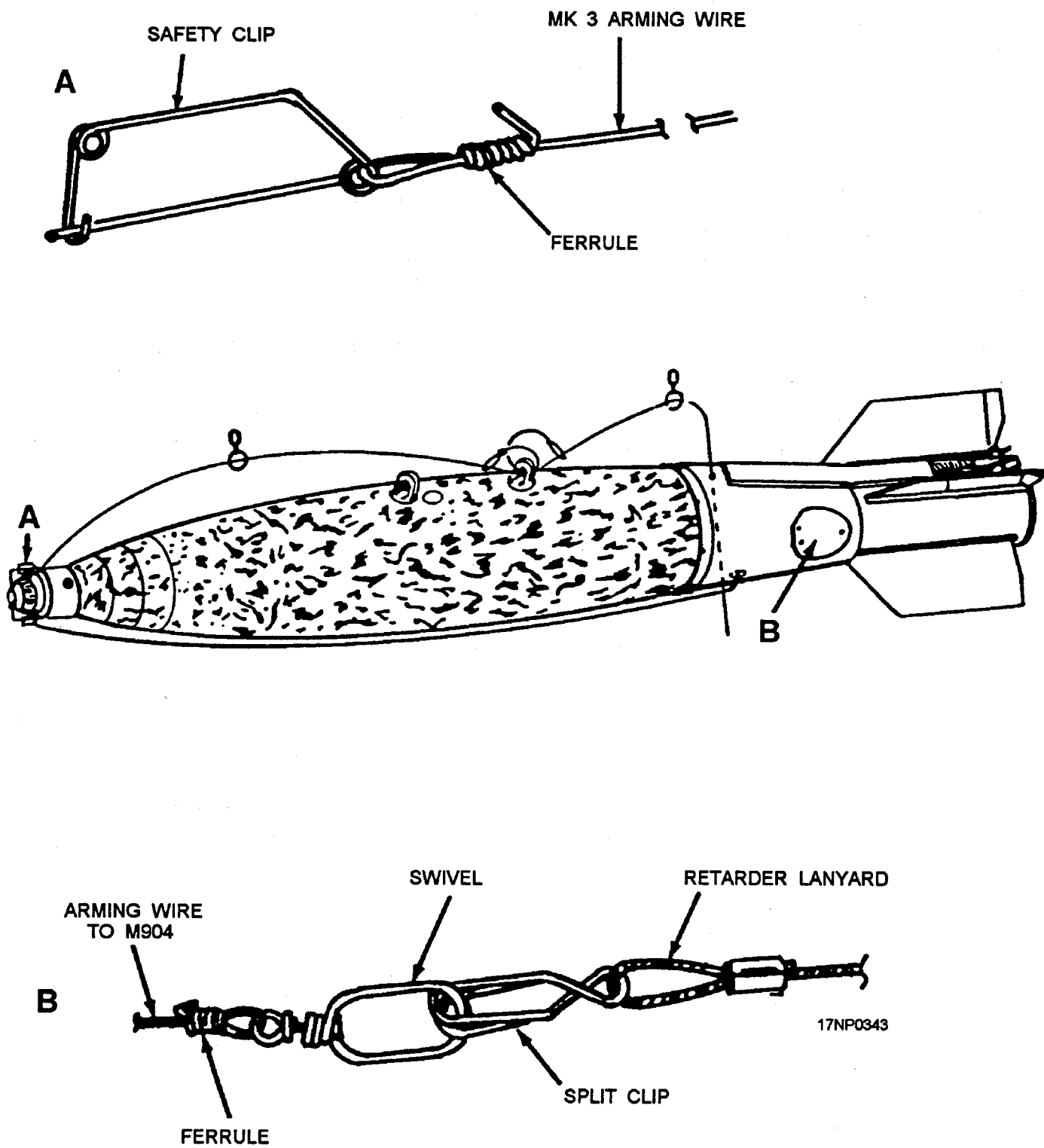


Figure 13-12.—Arming wire and split clip installation.

REVIEW NUMBER 1

7. Attach the split clip to the arming wire swivel, route the arming wire through the bottom arming wire hole, and then route forward (fig. 13-12).

8. Fabricate composite arming wire after it is routed through bottom arming wire hole in fin.

9. Attach swivel end of the composite arming wire to the split clip on the fuze lanyard assembly.

10. Tape the arming wire to the bomb body.

11. (BSU-85/B) Re-install access cover.

12. (BSU-86/B) Ensure the lanyard clip and safety latch pin are installed and the safety pin assembly is removed.

13. (BSU-86) Install fin release safety clip into retaining band latch.

14. On the BSU-86, remove fin safing pin assembly.

15. Wrap uncut Mk 3 arming wire around the fin, and feed excess wire into appropriate hole in fin.

If you want more information about the configuration and assembly procedures for the GP bombs, you should refer to *Aircraft General Purpose Bombs, Fire Bombs, Practice Bombs, Fuzes, and Associated Components*, NAVAIR 11-5A-17, and *Airborne Weapons Assembly Manual*, NAVAIR 11-140-5.

- Q1. For information about the GP bomb assembly, you should refer to _____.
- Q2. A maximum of _____ of thermal coating can be missing from a GP bomb and it is still considered thermally protected.
- Q3. What mechanical nose fuze is used with the thermally protected Mk 80 bomb?
- Q4. What electric tail fuzes can you use in live GP retarded bombs?
- Q5. Mk 122 arming safety switches are installed in GP bombs in a _____.

SUBCALIBER PRACTICE BOMBS

The practice bombs normally used on a routine basis are the Mk 76 Mod 5 and the BDU-48. These practice bombs are discussed briefly in the following paragraphs.

Mk 76 Mod 5 Practice Bomb

The Mk 76 Mod 5 practice bomb (fig. 13-13) is prepared for aircraft loading as discussed in the following steps:

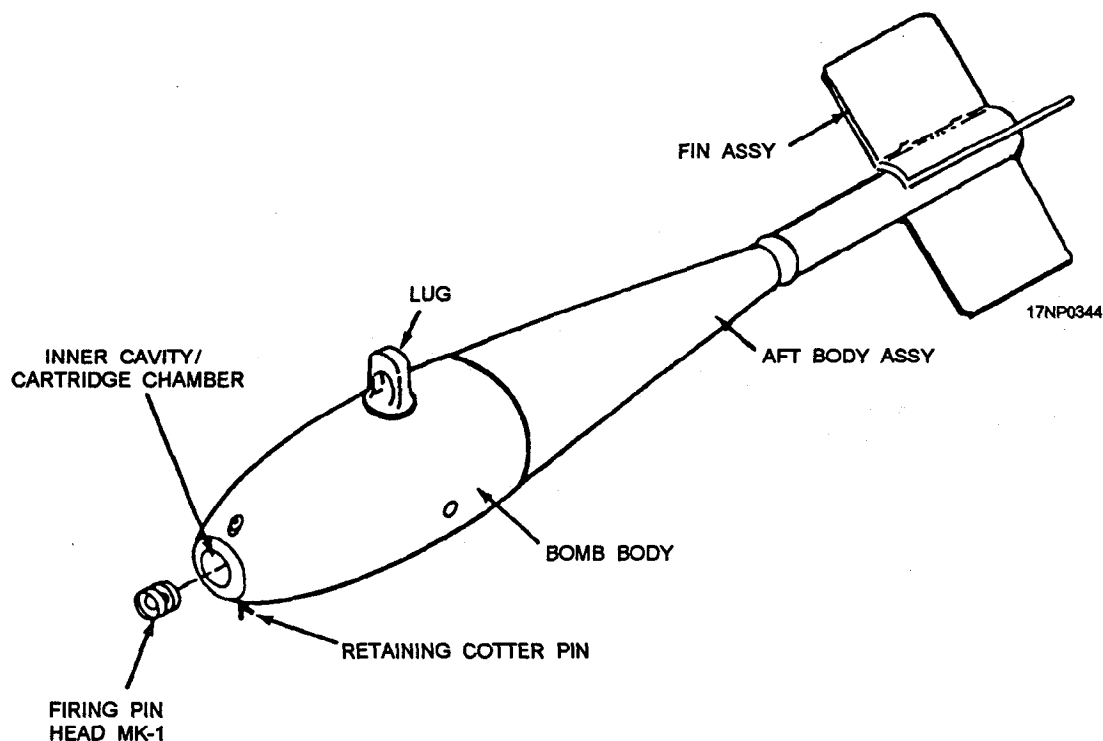


Figure 13-13.—Mk 76 Mod 5 practice bomb.

WARNING

Be extremely careful when handling a practice bomb loaded with a signal. Jarring or dropping the bomb may detonate the signal. Do not, under any circumstances, point either end of the bomb toward another person. Loading personnel must not place their bodies in line with the nose or tail end of a bomb.

1. Remove the bomb from the cardboard container.
2. Remove the cotter pin and Mk 1 firing-pin assembly from the nose. Inspect it for rust and deformation. Ensure the firing-pin cup is not deformed and the firing-pin point is below the lip of its cup.
3. Inspect the blast tube for rust and obstructions. Clean as required. When any obstructions are noted, proceed as follows: Insert a plug gauge SK923AS503 into the center cavity. The gauge should slide into place until the shoulder rests flush against the bomb. When the gauge shoulder does not rest against the bomb, the cavity is not clear. When the obstruction cannot be removed, reject the bomb as unserviceable, and dispose of it by following current instructions.

WARNING

A signal cartridge must not be swollen or deformed in any manner. The primer must be flush with or slightly below the base of the cartridge. If you attempt to install a deformed signal, it can cause detonation. Use extreme care when you handle a signal cartridge. When a practice bomb is not used

after the signal has been installed, the signal must be gently removed and replaced in the original shipping container. The cartridge can be reloaded and used later. Do not apply pressure to force the signal cartridge or firing-pin assembly into the bomb because the assembly could become deformed and fire the signal.

4. With the firing-pin assembly removed, elevate the nose of the bomb. Insert the Mk 4 Mod 3 or CXU-3A/B practice bomb signal, primer end up, into the nose of the practice bomb. Slide it gently into place. Do not use force. The base flange of the signal cartridge must rest on the bore shoulder, which is about 1 1/4 inches inward from the nose of the bomb.
5. Carefully insert the firing-pin assembly with the firing-pin end toward the signal.
6. Rotate the firing-pin assembly so that the two notches in the lip of the forward cup line up with the cotter pin holes in the nose end of the bomb. Do not apply pressure to the firing pin during this procedure.
7. Insert the cotter pin through the pinholes in the bomb body. Pass it through the notches in the firing-pin assembly. Spread the ends of the cotter pin just enough to retain it in place.

BDU-48 Practice Bomb

The BDU-48 practice bomb is prepared for aircraft loading as discussed in the following steps:

NOTE: The warnings discussed for the Mk 76 Mod 5 also apply to the BDU-48.

REVIEW NUMBER 1 ANSWERS TO QUESTIONS Q1. THROUGH Q5.

- A1. *For information about the GP bomb assembly you should refer to Airborne Weapons Assembly Manual, NAVAIR 11-140-5.*
- A2. *A maximum of 56 square inches of thermal coating can be missing from a GP bomb, and it is still considered thermally protected.*
- A3. *An M904E4 mechanical nose fuze with an M148E1 adapter booster is used with the thermally protected Mk 80 bomb.*
- A4. *Only the Mk 376 and FMU-139 electrical tail fuzes are used in live GP retarded bombs.*
- A5. *Mk 122 arming safety switches are instilled in GP bombs in a RADHAZ-free environment.*

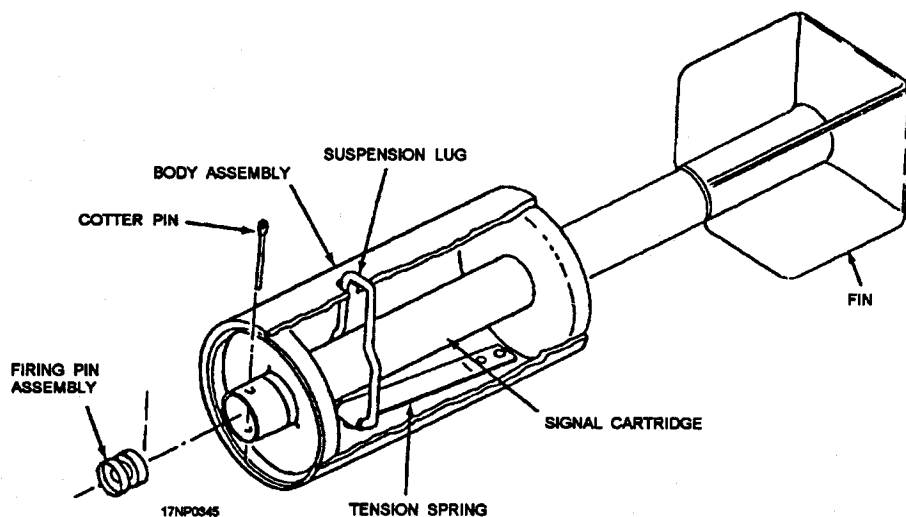


Figure 13-14.—BDU-48/B practice bomb.

1. Remove the bomb assembly from the container.
2. Remove the firing device and inspect for rust or deformation. Refer to figure 13-14 for identification of the components.
3. Inspect the blast tube for rust and deformation. Clean as required.
4. Insert the signal into the sleeve. With the firing device removed, elevate the nose of the bomb. Insert the Mk 4 or CXU-3A/B practice bomb signal, primer end up, and slide it gently into place. Do not use force. The base flange of the signal cartridge must rest on the bore shoulder.

5. Carefully insert firing pin assembly into the nose of the bomb.

6. Align firing pin assembly notches with the two holes in the nose end of the bomb. Insert cotter pin through holes in bomb body, and spread end of cotter pin just enough to remain in place.

For detailed information concerning the preparation of practice bombs for aircraft loading, refer to the publication NAVAIR 11-140-5.

FULL-SCALE PRACTICE BOMBS (BDU-45)

Preparation and inspection of BDU-45 (fig. 13-15) full-scale practice bombs are the same as the GP bombs

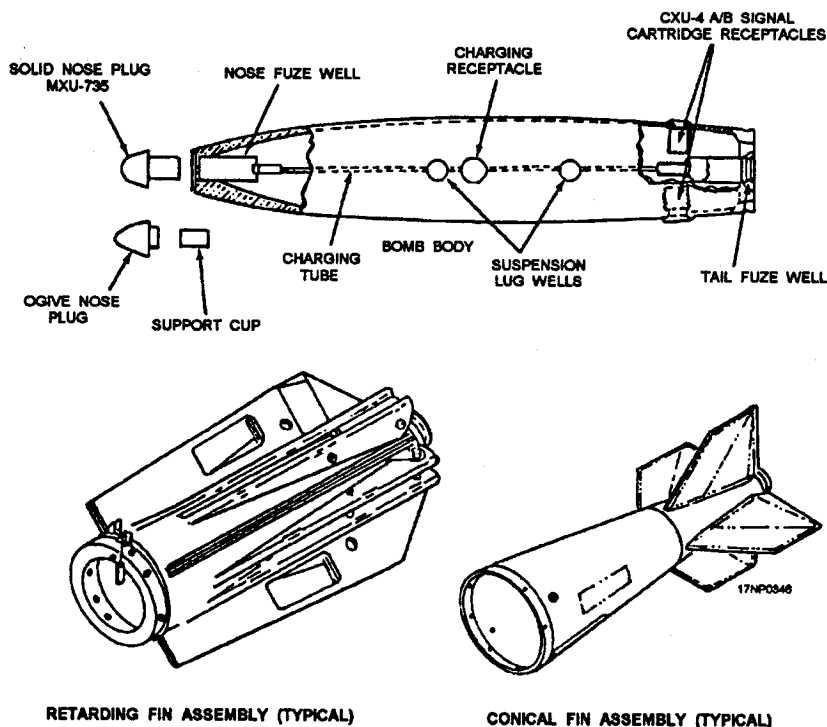


Figure 13-15.—BDU-45/B (typical) practice bomb.

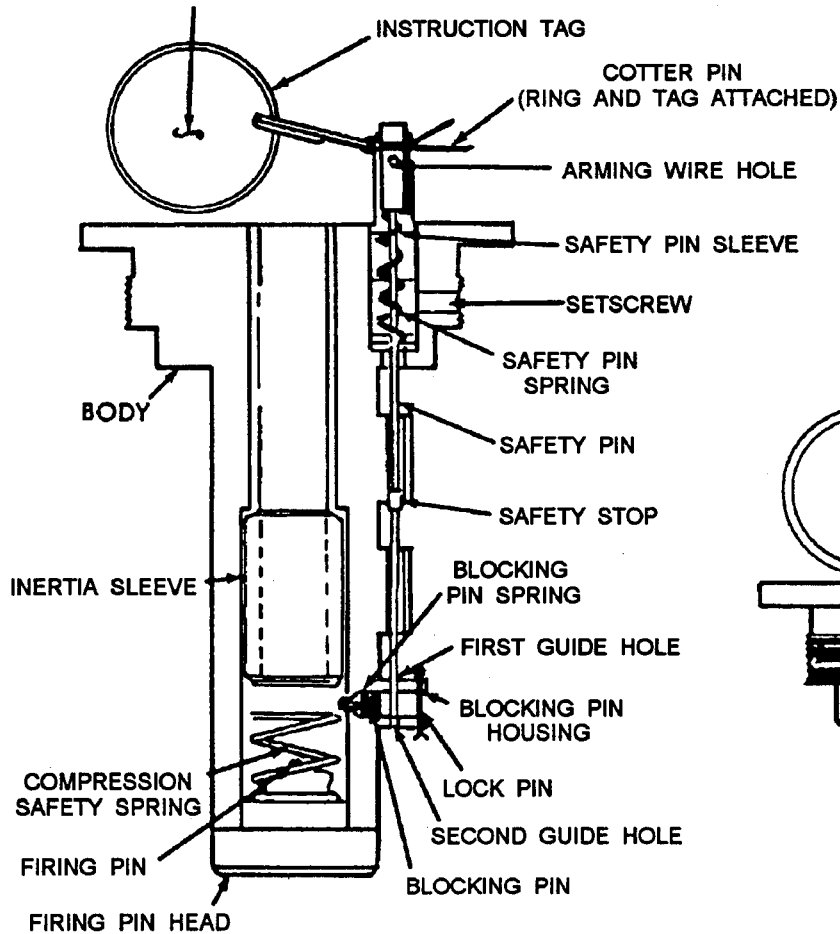
discussed earlier in this chapter with the following exceptions. The spotting charge receptacles must be checked to ensure they are clean, free of foreign material and moisture, and not deformed.

CXU-4/B Spotting Charge

Prepare, inspect, and install the CXU-4/B spotting charge as follows:

1. Check spotting charge for damage or leakage.

REMOVE AFTER ARMING
WIRE HAS BEEN INSERTED.
IF BOMB IS NOT DROPPED,
REPLACE BEFORE
REMOVING ARMING WIRE.



2. Ensure retaining ring and spring washer are present.

3. Install spring washer at base of spotting charge receptacle.

4. Slide spotting charge into receptacle and secure with retaining ring (pliers may be required).

MXU-735 Nose Plug

Inspect and install nose plug as follows:

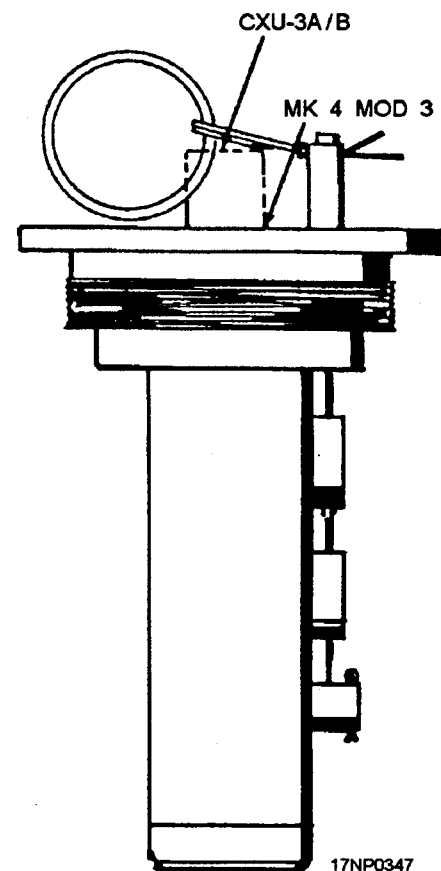


Figure 13-16.—Mk 89 Mod 0 bomb spotting charge adapter.

1. Ensure threads are not damaged
2. Install nose plug, tighten with spanner wrench or ratchet, and tighten nose setscrew.

Electric/Electronic Tail Fuzes

Procedures for inspection and installation of tail fuzes FMU-139 and Mk 376 are the same as for GP bombs, as outlined previously in this chapter.

Mk 89 Mod 0 Spotting Charge Adapter

Prepare and inspect the Mk 89 spotting charge adapter (fig. 13-16) as follows:

1. Remove tape holding cotter pin with instruction tag attached
2. Remove inertia sleeve and compression safety spring by unscrewing firing pinhead from adapter body.
3. Inspect all components, and reject adapter if any components are damaged.

Mk 4 and CXU-3 Cartridge Installation

Install signal cartridge in spotting charge adapter as follows:

1. Insert inertia sleeve into cavity body.
2. Slide cartridge through inertia sleeve with cartridge rim against forward end of sleeve.
3. Press blocking pin inward until safety pin presses through the second guide hole, locking blocking pin in place.
4. Insert cotter pin through outer set of holes in head of safety pin and safety pin sleeve. Bend leg of cotter pin slightly to hold in place.
5. Place compression safety spring over firing pin head into adapter body and hand tighten.

Mk 89 Spotting Charge Installation

Install Mk 89 spotting charge adapter with signal cartridge as follows:

1. Verify bomb tail well is clean.
2. Insert adapter in the same manner as electric fuzes.

NOTE: The procedures for inspection and installation of nose fuzes and bomb fins are the same as those discussed previously in this chapter for GP bombs.

GUIDED-BOMB UNIT (GBU) ASSEMBLY

GBUs are general-purpose bombs configured with a wing assembly and a computer control group. Preparation and inspection of the GBU's are the same as the GP bombs, discussed earlier in this chapter,

Wing Assembly Installation

Install the wing assembly on the bomb as follows:

1. Ensure safety pins are securely installed in latch release lever and collar assembly (fig. 13-17).

2. Remove access covers.

NOTE: Refer to figure 13-18 for steps 3 through 8.

3. Attach Mk 3 arming wire to aft suspension lug.

4. Insert arming wire through MAU-166 swivel loop.

5. Orient wings as follows:

- a. Position GBU-12 and GBU-16 wings in X configuration with the wing release latch mechanism at 9 o'clock, with the bomb lugs at 12 o'clock when viewed from the rear.

- b. Position GBU-10 wings so that latch mechanism is at 12 o'clock in line with the bomb lugs.

NOTE: Mk 3 arming wire installation for the GBU-12 and GBU-16 is the same as for GP bombs, discussed earlier in this chapter. For the GBU-10, install arming wire through hole at the 3 o'clock position of wing and route through pull-out pin/gagrod and pass wire out through hole at 9 o'clock position of wing assembly.

6. Remove safety cotter pin from pull-out pin/gagrod.

7. Keep arming wire taut while pressing the wing against the bomb body. Hand tighten setscrews.

8. Torque setscrews to the required torque.

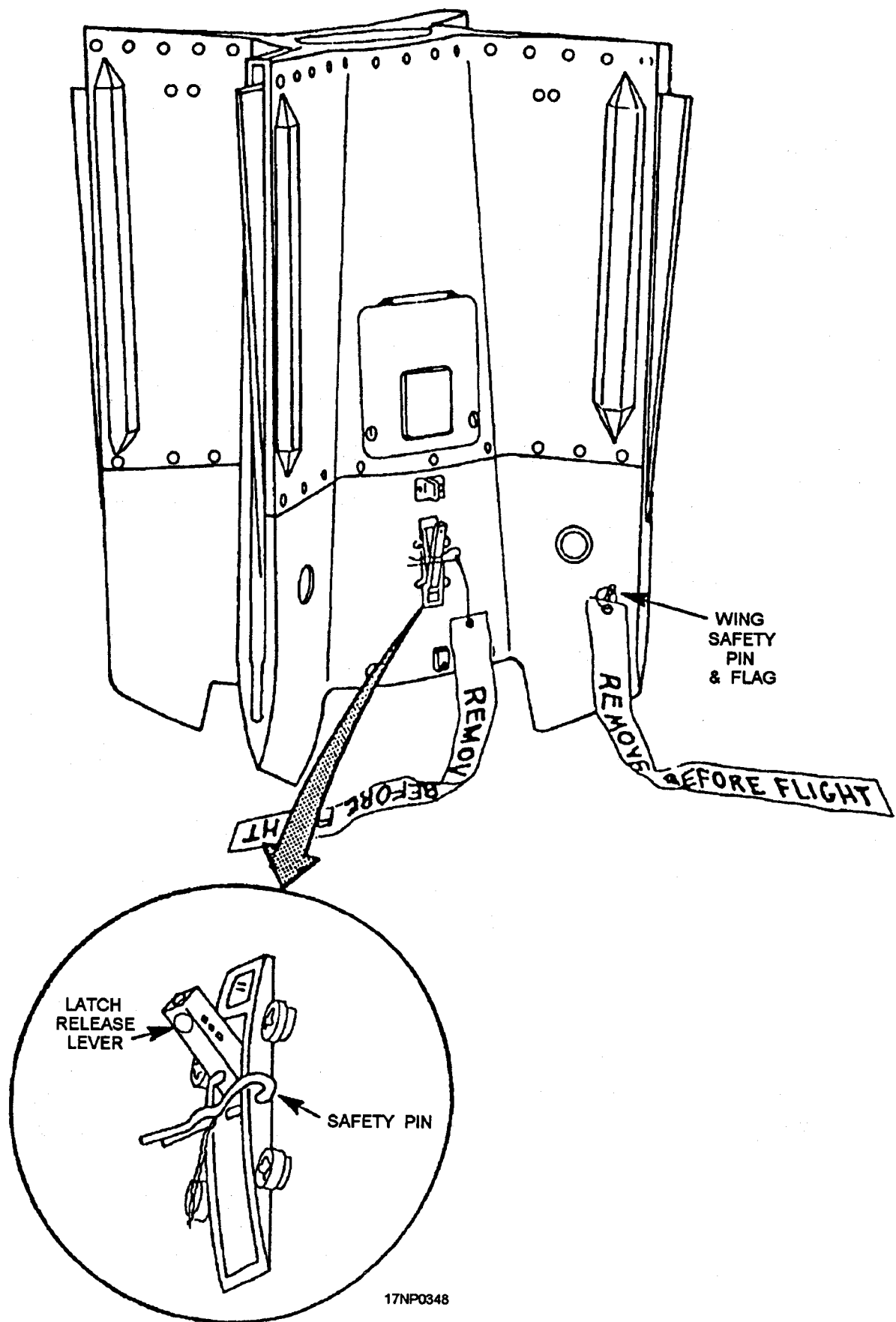
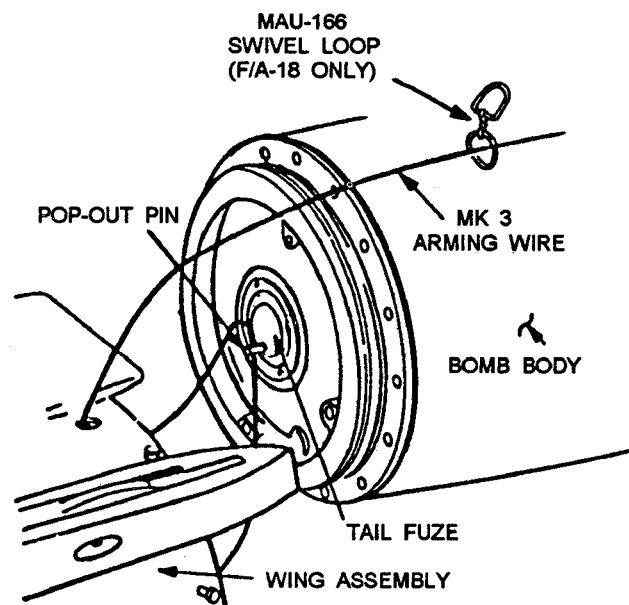
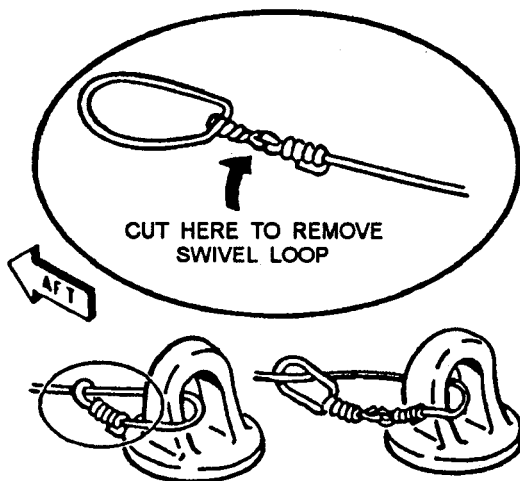
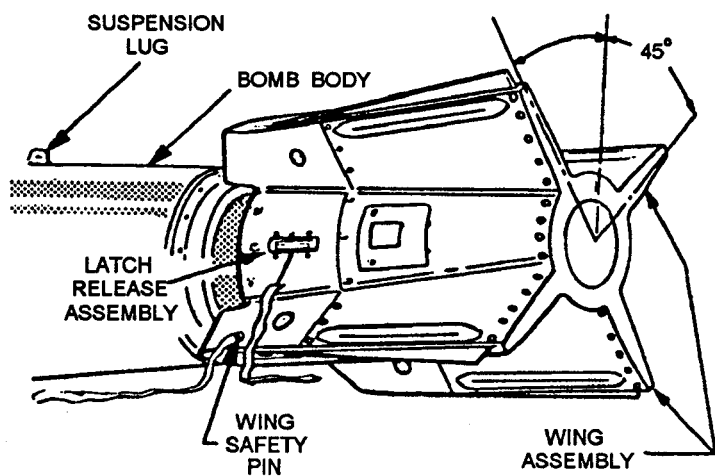


Figure 13-17.—Wing assembly.

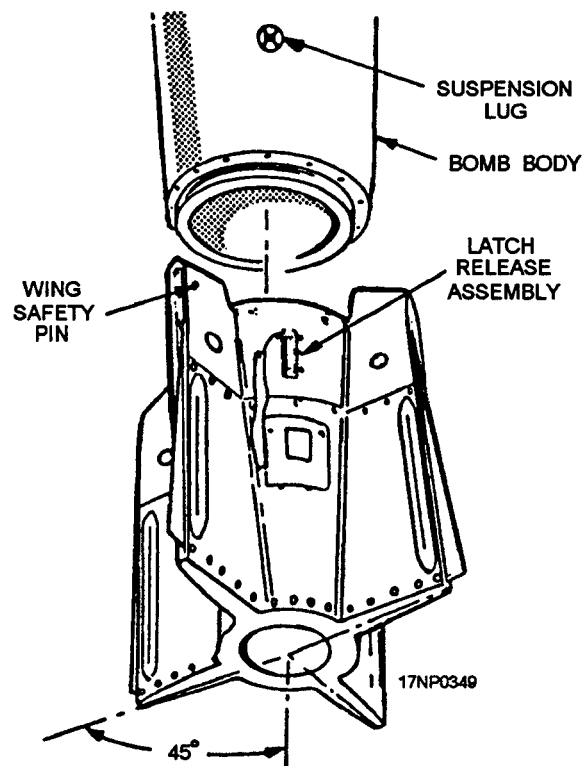


PREFERRED ATTACHMENT
PRIOR TO ATTACHING
ARMING WIRE REMOVE
SWIVEL LOOP AS SHOWN
IN INSET.

ALTERNATE ATTACHMENT
IF SWIVEL LOOP IS NOT
REMOVED ENSURE THAT
ARMING WIRE IS
INSTALLED SO THAT
SWIVEL LOOP IS
POSITIONED OUTSIDE OF
BOMB LUG.



SIDE VIEW



TOP VIEW

Figure 13-18.—GBU-12/16/10 wing assembly installation.

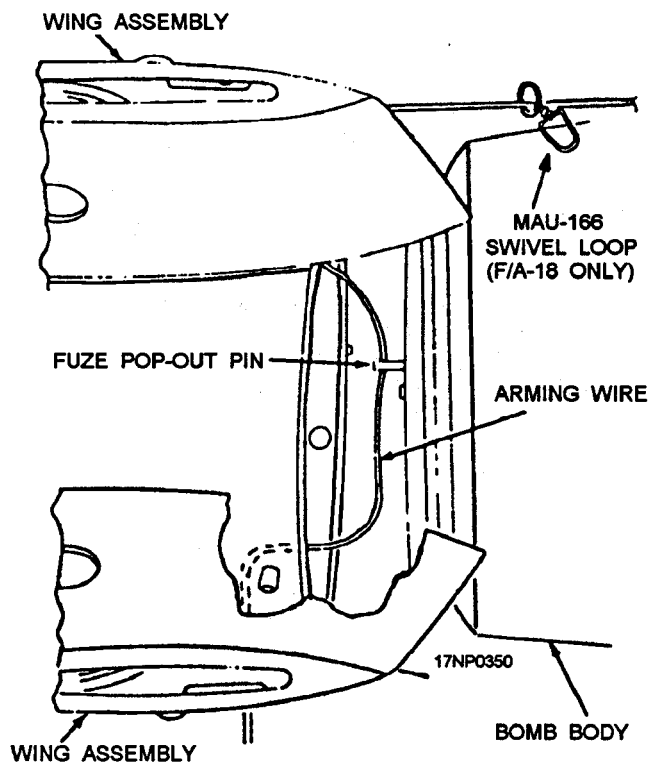


Figure 12-19.—Arming wire installation.

9. Remove the access cover, ensure that no kinks are in the arming wire, and that the wire is not looped around pull-out pin (fig. 13-19).

10. Secure access cover.

11. Wrap arming wire around wing assembly.

12. Mark wing assembly with type of fuze and date installed, fuze safety pin removed, and current date and QA initials.

Forward Adapter Assembly Installation

Install forward adapter assembly (fig. 13-20) on nose of bomb as follows:

1. Place O-ring on external threads of retainer bolt.

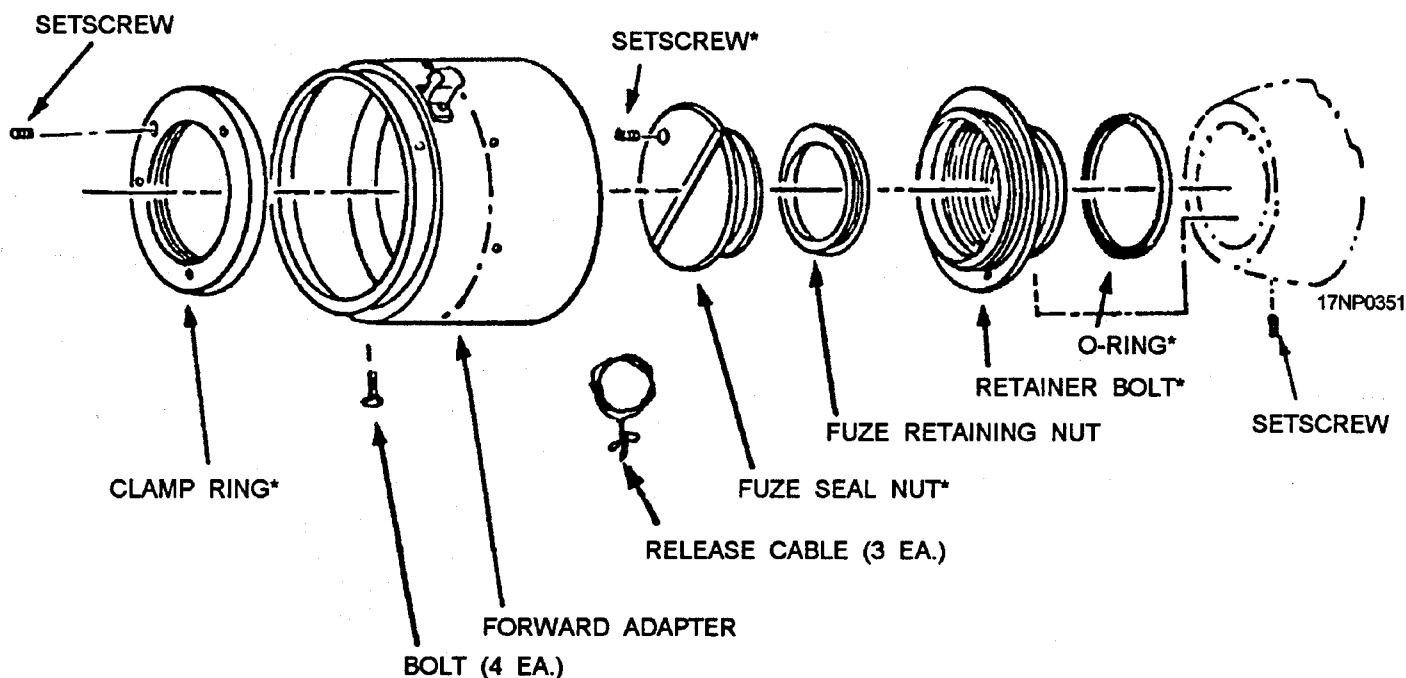
2. Install retainer bolt into nose fuze well (fig. 13-21).

3. Torque retainer bolt to specified torque by using wrench adapter (fig. 13-21).

4. Apply specified torque to setscrew in nose fuze well (fig. 13-21).

5. Install fuze seal nut in retainer bolt and tighten (fig. 13-21) setscrew.

6. Place open end of forward adapter over nose bomb body. Align arming wire guide with suspension lugs on bomb body.



*FUZE RETAINER AND BOLT ASSEMBLY 310021-1

Figure 13-20.—Forward adapter assembly with fuze retaining bolt.

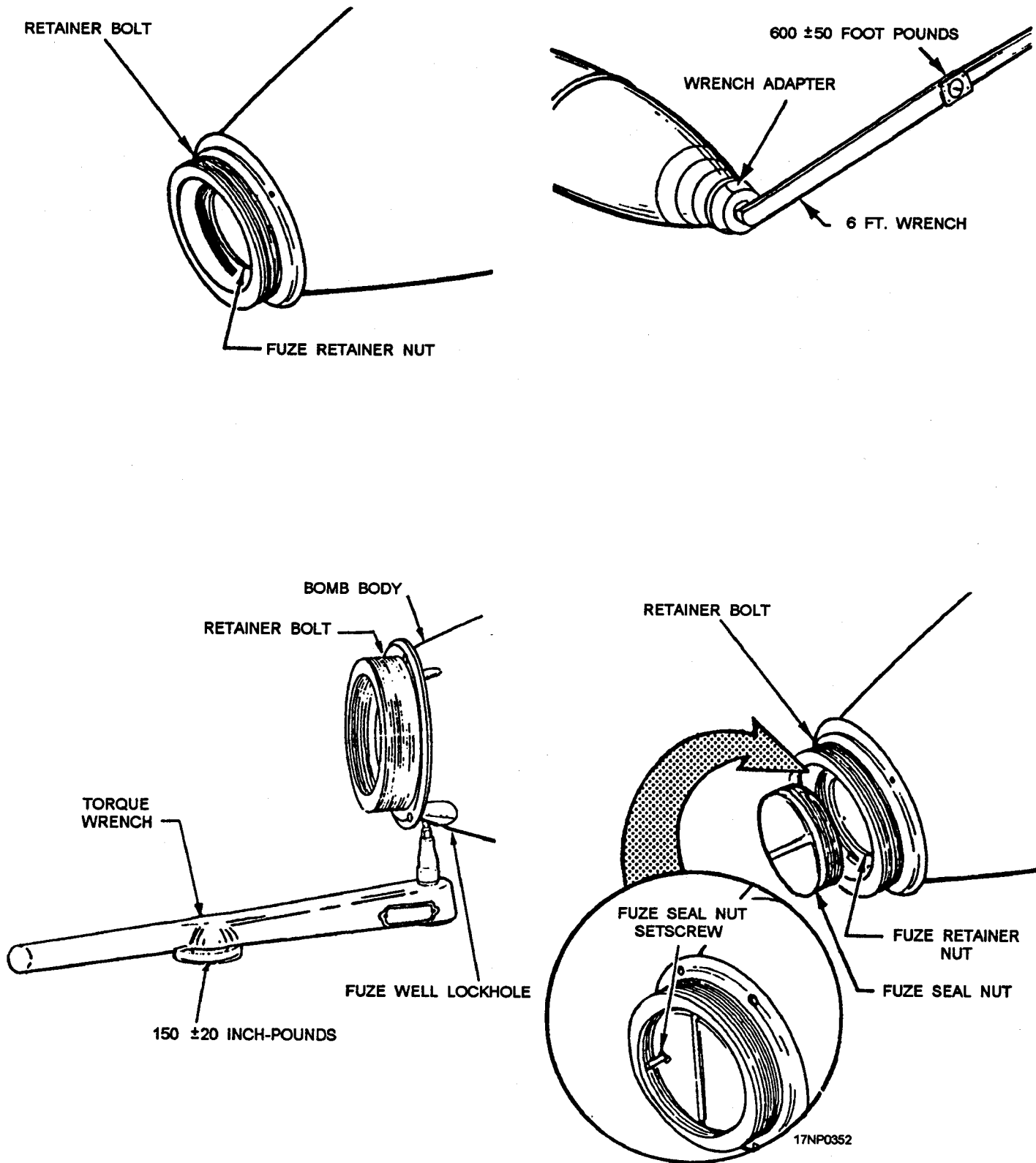


Figure 13-21.—Retainer bolt and sealing nut installation.

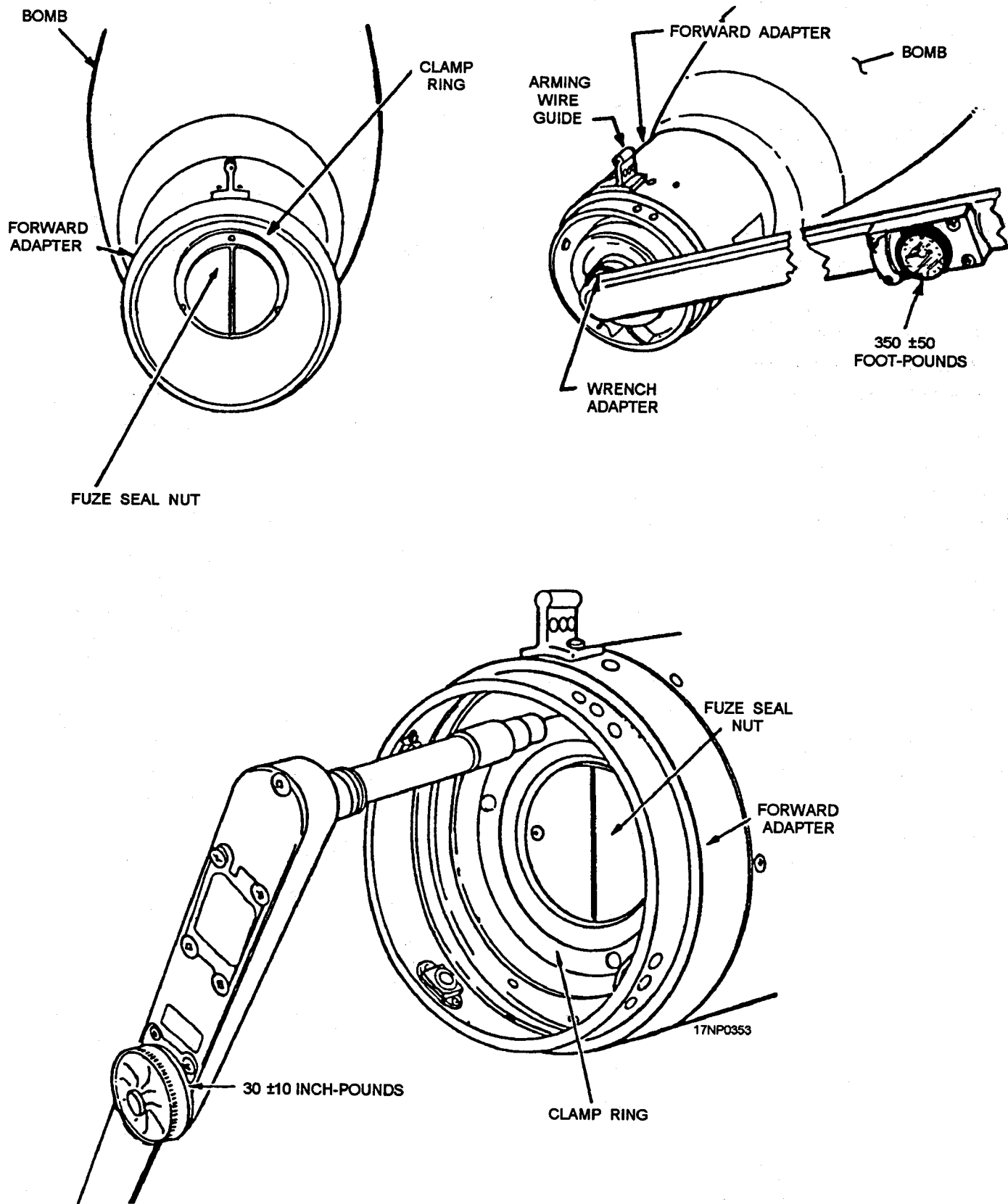


Figure 13-22.—Clamp ring installation.

7. Install clamp ring onto retainer bolt (fig. 13-22). Back out setscrew to prevent assembly interference.

8. Torque clamp ring to specified torque.

9. Verify arming wire guide is aligned with suspension lugs of bomb body.

10. Apply specified torque to clamp ring setscrew (fig. 13-22).

Computer Control Group Installation

Install the computer control group (CCG) as follows:

1. Visually inspect CCG for physical damage.
2. Ensure thermal battery firing pin assembly safety wire and pull-out pin are installed (fig. 13-23).
3. Ensure control section seal is installed.
4. Remove detector dome protective cover and packing, inspect detector for cracks through the dome thickness, portions of the dome missing, or abrasion that prevents you from visually seeing the internal parts.
5. Inspect humidity detector ring inside of the detector optic assembly for indication of moisture.
6. Ensure detector moves freely on gimbals.
7. Replace detector dome protective cover and packing.
8. Position CCG on forward adapter (fig. 13-23), and align thermal battery firing pin assembly with arming wire guide on forward adapter.
9. Install four bolts through CCG mounting hole and forward adapter. Apply specified torque to bolts.

5.0-INCH AIRBORNE ROCKET ASSEMBLY PROCEDURES

The following 5.0-inch airborne rocket assembly procedures are used when you load the LAU-10 airborne rocket launcher. The LAU-10 airborne rocket launcher is discussed in chapter 2 of this TRAMAN. If the rocket launcher is being reused, it must be sent to AIMD for electrical checkout prior to loading.

The 5.0-inch rocket components maybe received as follows: The rocket motors are preloaded in the 4-round LAU-10 launcher, and the fuze and warhead are shipped in separate shipping containers, or all rocket components are shipped in separate authorized shipping containers.

Unpacking Rocket Components

Rocket motors and other rocket components are unpacked as discussed in the following steps:

WARNING

Banding straps are under tension. You must use care in cutting them to prevent injury.

1. Open wooden shipping crates by using hand tools, such as shears or steel strap cutters. Cut or untwist the securing wires from the metal containers with shears or pliers. Remove the end pans from the launcher shipping containers.

2. Keep all containers in a horizontal position while opening them. During the assembly procedure, keep the rocket warheads and motors in a horizontal position. This decreases the possibility of accidents.

3. All retrograde items, such as metal boxes, wooden boxes, spacers, and thread protectors, are

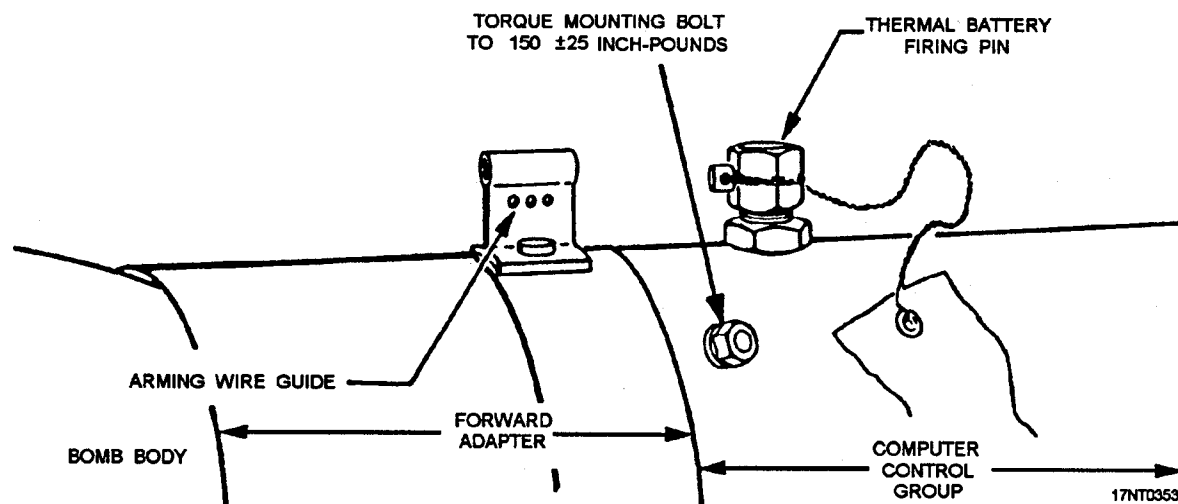


Figure 13-23.—Computer control group installation.

removed from the components in preparation for assembly. These retrograde items must be retained and disposed of according to current directives.

Inspecting Rocket Components

As the rocket components are removed from their shipping containers, inspect them by performing the steps listed below. Dispose of defective items according to current directives. The components you inspect include launchers, warheads, fuzes, and rocket motors, to include their fins.

WARNING

To avoid personal injury and equipment damage in an operation involving assembly, disassembly, fuzing, defuzing, or cleaning, you must do the work in a designated area. This area must be safely located away from other explosives and vital installations. Only the smallest number of rockets practicable should be exposed. Only authorized personnel essential to the work should be permitted in the vicinity. Refer to the publications NAVAIR 16-1-529 and NAVORD OP 3565 for RADHAZ procedures and precautions.

WARHEADS.— Inspect the warheads as follows:

WARNING

Warheads that are cracked or have a gap between the fuze adapter and the warhead are hazardous.

1. Verify that the warhead is not cracked and no gap exists between the fuze adapter and the warhead.
2. On the Mk 32 warhead, verify that the fuze is staked
3. Verify that the base and fuze cavity threads are not damaged or corroded.

WARNING

Do not use a warhead that does not have the base fuze hole closed by a steel plug or a base fuze. Base fuzes must not protrude more than 1/16 inch. Detonation could occur during handling or firing.

NOTE: Do not disassemble base adapters from the warheads to check for base plugs.

4. Verify that the warhead contains a base fuze or a steel base plug. When installed, ensure the base fuze does not protrude more than 1/16 inch.

FUZES.— Inspect the fuze as follows:

WARNING

Fuzes that are damaged are hazardous. Detonation may occur.

CAUTION

Do not use Mk 93 or M414 fuzes with nose cones that are completely penetrated by scratches, cracks, or abrasions. Minor scratches or abrasions do not affect their performance or safety.

1. Verify that the fuze body is not damaged.
2. Check the fuze threads for damage or corrosion.

ROCKET MOTORS.— Inspect the motor as follows:

1. Verify that the motor tube is not dented, deeply scratched, gouged, or corroded

WARNING

Use an authorized metal shielding band assembly only. Do not substitute the Mk 71 motor plastic fin retainer band because it offers no RADHAZ protection.

NOTE: Rocket motors packaged in individual wooden containers may be received with the old, narrow, metal shielding band (P/N 1516140) installed. This band is obsolete and must be replaced with shielding band assembly P/N 4902192 when unloaded from the launchers.

2. Verify that the shielding band and the RADHAZ barrier are in place.
3. Verify that the nozzle plug is in place.
4. For rocket motor Mk 71, verify that the fin retainer is in place, the fins are not bent or broken and the fin pin is clean and free of foreign matter. The spring-loaded fins must be exercised four to six times.
5. The motor contact bands, motor tube threads, and nozzle and fin assembly must be clean and free of grease or other lubricants.
6. Check threads for damage or corrosion.

Assembly of Rocket Components

Rocket components are assembled as discussed in the following steps:

WARNING

Shielding bands must be in place whenever the rocket motor is out of or protrudes from the launcher. Ensure the shielding band covers the contact band but does not touch it.

1. Place detent lift arm in load position.
2. Push forward on aft end of rocket motor until forward end of rocket emerges from launcher.
3. Slide shielding band (fig. 13-24) over motor and hold against forward part of launcher; push motor forward until locking tabs seat in the motor detent grooves and not in the contact band groove.

NOTE: A standard rocket assembly tool kit containing crowfoot wrenches, a torque wrench, detent locking wrenches, chain wrenches, and strap wrenches is available for the assembly of 2.75-inch and 5.0-inch rockets.

4. Hold motor with strap wrench. Screw warhead into motor and tighten securely with chain wrench until the warhead seats 360 degrees.
5. Attach appropriate nose fuze and tighten.

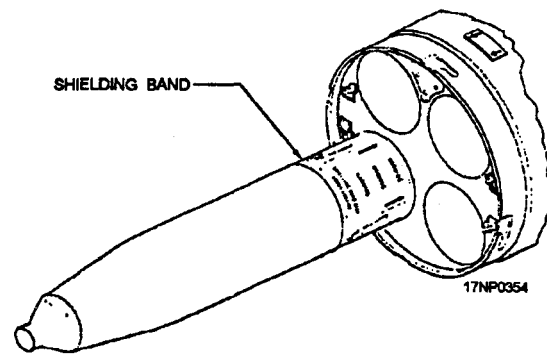


Figure 13-24.—5.0-inch rocket RADHAZ and electrostatic protection.

6. Push rocket motor slowly into the tube until aft end contacts aft stop.
7. Rotate detent lift arm to flare position.
8. Push the motor forward hard; pawl will engage groove with audible click indicating positive engagement.

2.75-INCH AIRBORNE ROCKET ASSEMBLY PROCEDURES

Unpacking and inspection of the warhead, fuzes, and motor are essentially the same as for the 5.0-inch rocket components discussed earlier in this chapter. Assemble rocket components as follows:

1. Place rocket motor body in holding fixture (fig. 13-25).

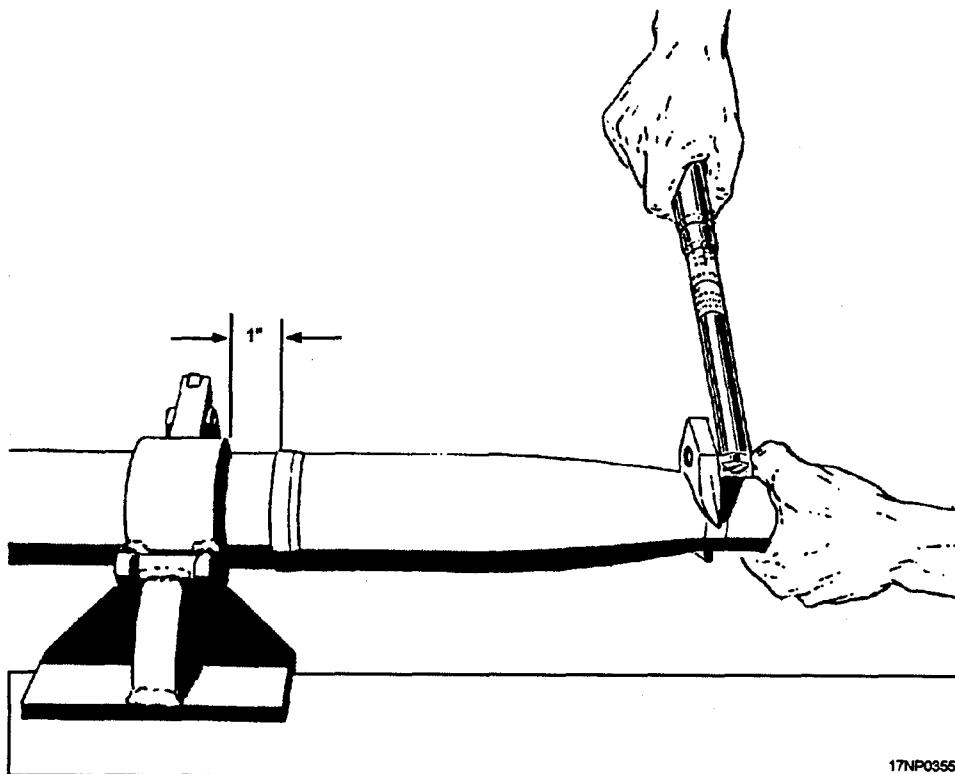


Figure 13-25.—Holding fixture assembly.

2. Hand tighten warhead to motor.

3. Apply the specified torque to the warhead by using a crowfoot adapter and torque wrench (fig. 13-25).

NOTE: Some warheads only require tightening until the warhead seats on the motor 360 degrees.

4. Install fuze hand-tight in the warhead.

5. Verify there is no gap between the fuze and warhead or warhead and motor.

6. Remove assembled rocket from holding fixture.

7. Remove and retain fin protector just before inserting rocket into launcher.

8. Slowly push the rocket into the tube by using rocket loading and release tool (fig. 13-26) until detent snaps into position in detent groove.

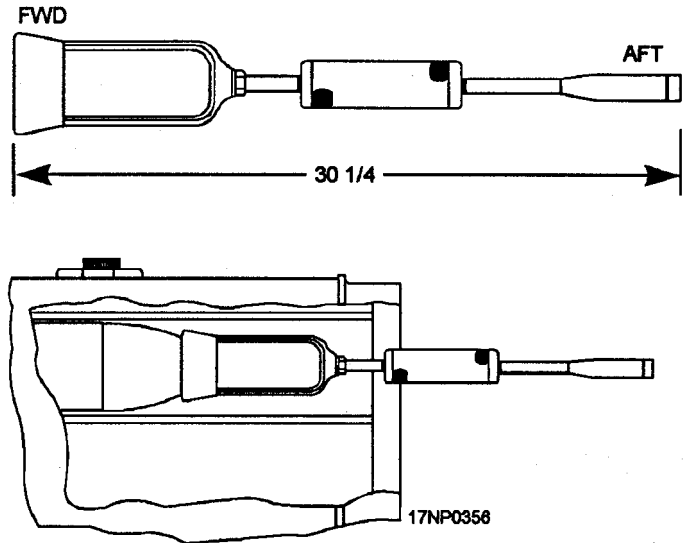


Figure 13-26.—Rocket loading and release tool.

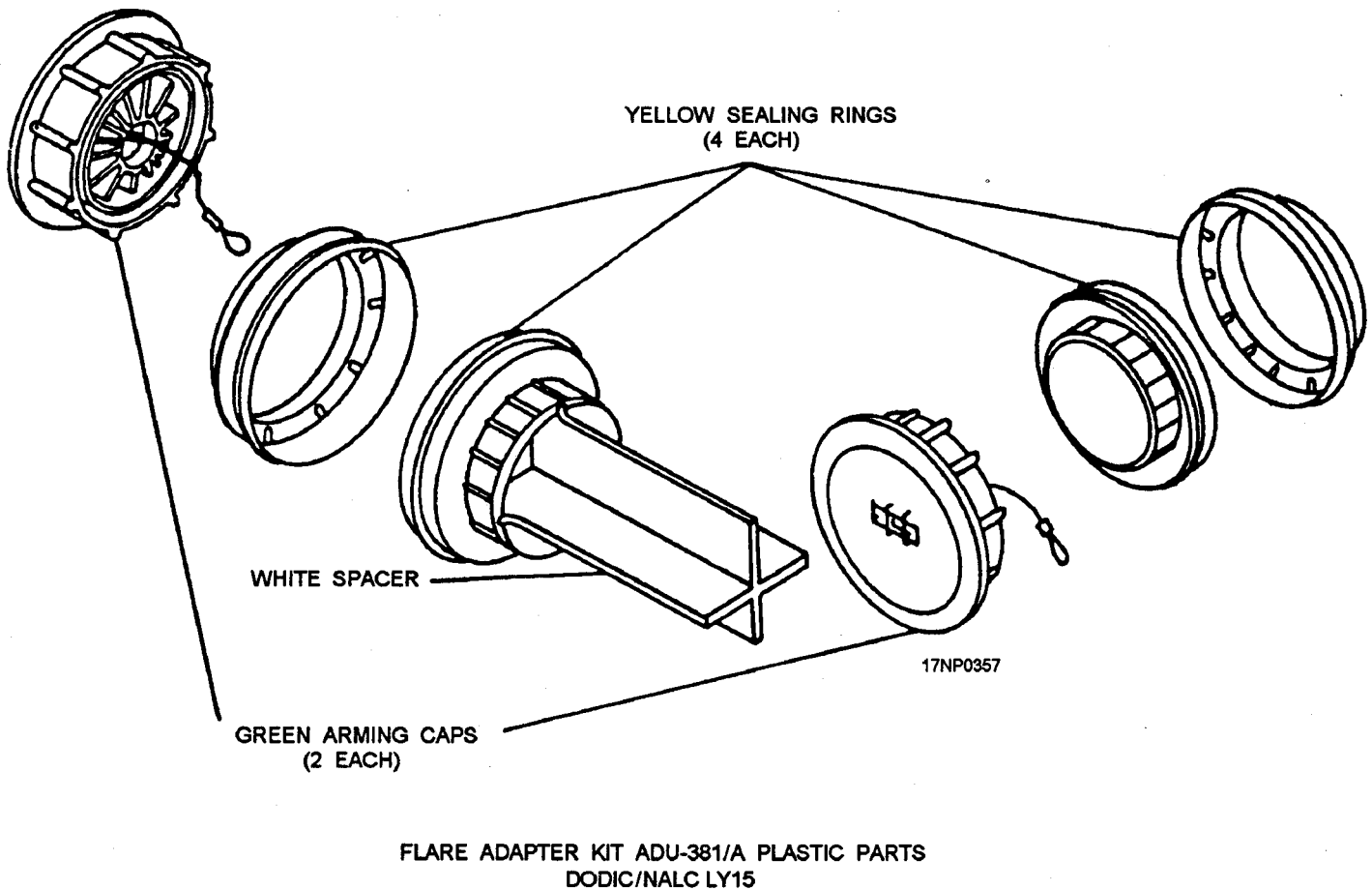


Figure 13-27.—Flare adapter kit.

CAUTION

When installing Mk 34 and Mk 63 warheads, use the chain wrench only in the area indicated by the decal. This prevents damage to the warhead.

NOTE: A groove may be cut in one nylon insert only of the practice warheads Mk 6 Mod 7 and Mk 32 Mod 0. This facilitates assembly of the warhead to the motor.

For detailed information concerning the assembly procedures of airborne rockets, you should refer to *Airborne Rockets*, NAVAIR 11-85-5; *5.0-Inch Airborne Rocket Launchers LAU-10 Series*, NAVAIR 11-75A-63; and *2.75-Inch Airborne Rocket Launchers*, NAVAIR 11-75A-61.

REVIEW NUMBER 2

- Q1. List the two subcaliber practice bombs normally used.
- Q2. List the two practice bomb signals used with the Mk 76 practice bomb.
- Q3. To what publication should you refer for detailed information about practice bombs?

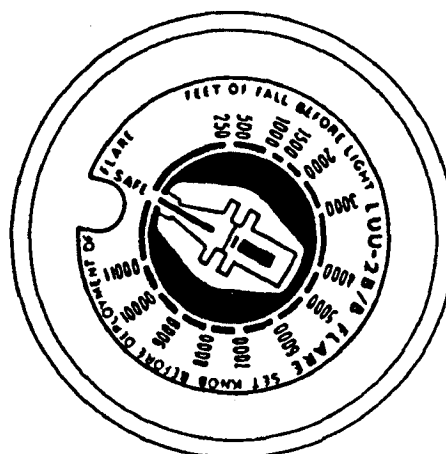
SUU-25 FLARE DISPENSER

Perform loading and unloading of the dispenser in authorized areas only.

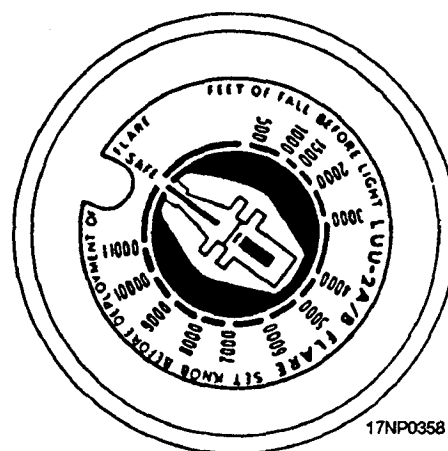
Adapter Kits

Install adapter kits on flares as follows:

1. Make sure the timer knob is on safe.
2. Make sure there is no external damage.
3. Check the adapter kit (fig. 13-27) for two green arming caps with serviceable arming lanyards, one white two-piece spacer, and four yellow sealing rings.
4. Rotate the time knob (fig. 13-28) to required setting.
5. Install yellow sealing ring on each end of flare.
6. Connect green arming cap lanyard (fig. 13-29) to timer knob.
7. Install green cap on yellow sealing ring.



LUU-2B/B TIMER SETTINGS



LUU-2A/B TIMER SETTINGS

Figure 13-28.—Timer knob settings.

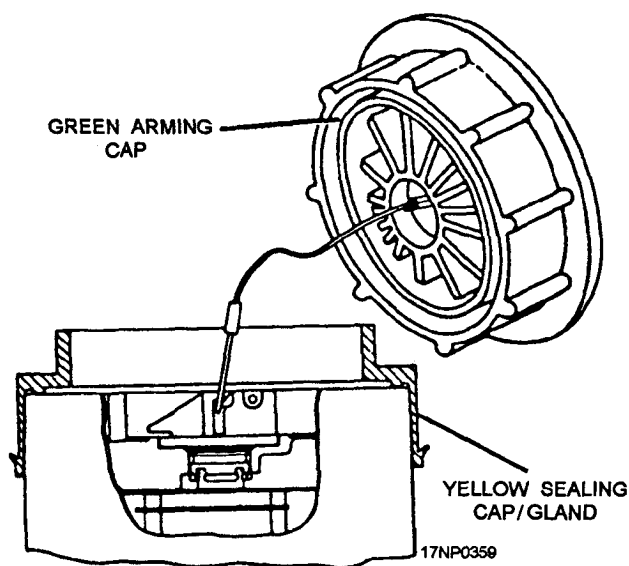


Figure 13-29.—Lanyard configuration.

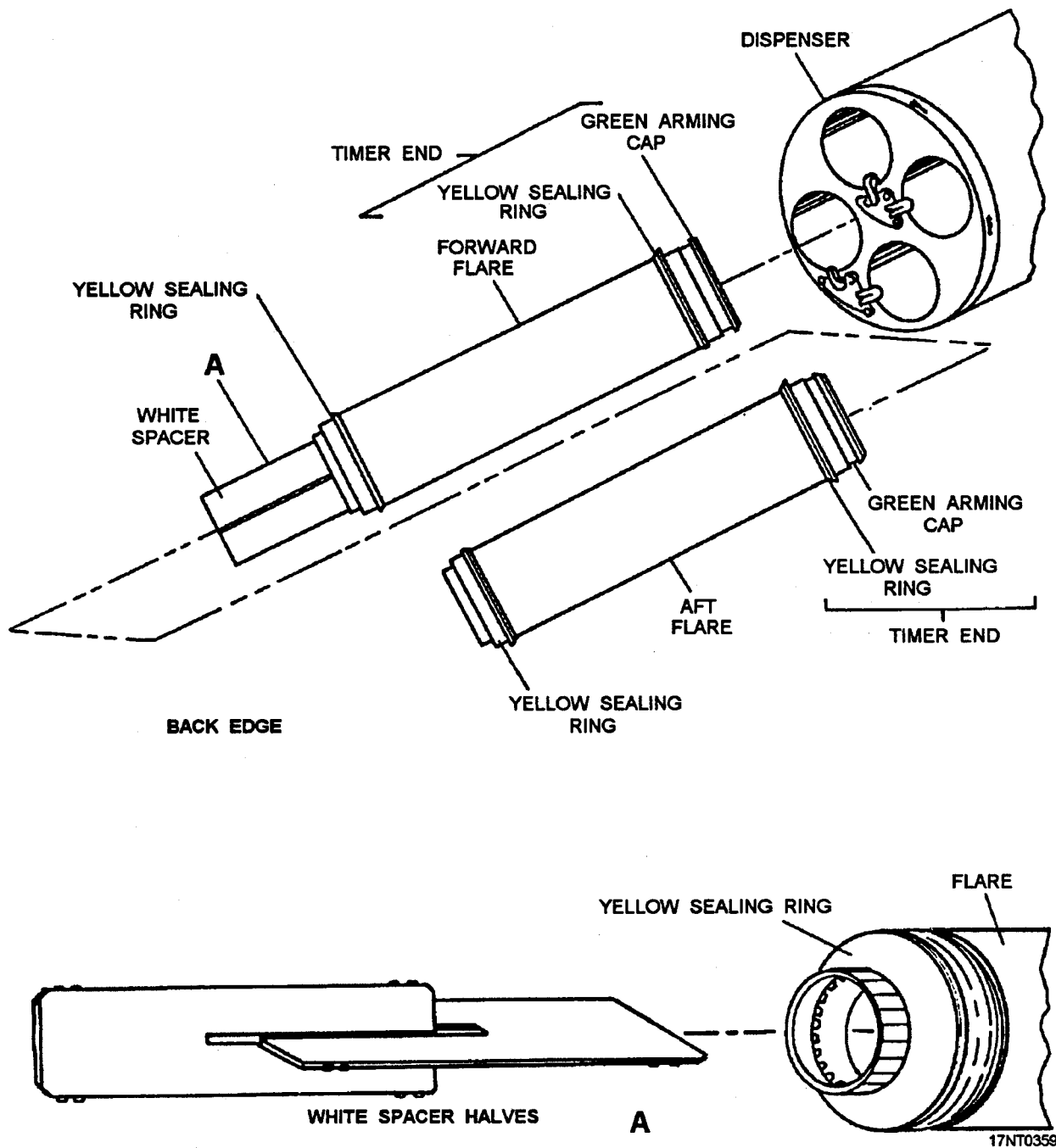


Figure 13-30.—Installation of spacer assemblies on flares.

REVIEW NUMBER 2 ANSWERS TO QUESTIONS Q1. THROUGH Q3.

- A1. Mk 76 and Mods and BDU-48/B are the two subcaliber practice bombs normally used.
- A2. The CXU-3A/B day use and the Mk 4 night use are the two practice bomb signals used with the Mk 76 practice bomb.
- A3. You should refer to NAVAIR 11-5A-17 for detailed information about practice bombs and signal cartridges.

8. Place the two halves of the white spacer together and install on the aft end of the forward flare (fig. 13-30).

Dispenser Preparation

Prepare dispenser for flare loading as follows:

1. Safety pin and flag installed in safety switch (fig. 13-31).
2. Stepper switch set on safe.
3. Ensure dispenser has been electrically checked.
4. Open breech caps, ensure sleeves are clean.
5. Open four downloading breech caps (fig. 13-32).

Flare Loading Procedures

Load flares into dispenser as follows:

1. Insert forward flare into tube with green arming cap forward, and ensure white spacer is properly seated

on yellow sealing ring and centered. Continue to push flare forward, and insert aft flare with green arming cap forward until forward flare is stopped against the expansion chamber.

2. Close aft retaining link and insert shear pin, with head of shear pin in the upward position. Spread shear pin tangs 30 to 40 degrees.

3. Rotate applicable forward retaining lock to locked position.

4. Install shear pin into lock with pinhead forward and spread tangs to 30 to 40 degrees.

5. Install four downloading breech caps and tighten.

6. Mark dispenser with the date loaded, munitions, lot number, timer setting, and electrical test date.

SAFETY PRECAUTIONS

Safety precautions prescribe the minimum requirements and regulations you should observe when

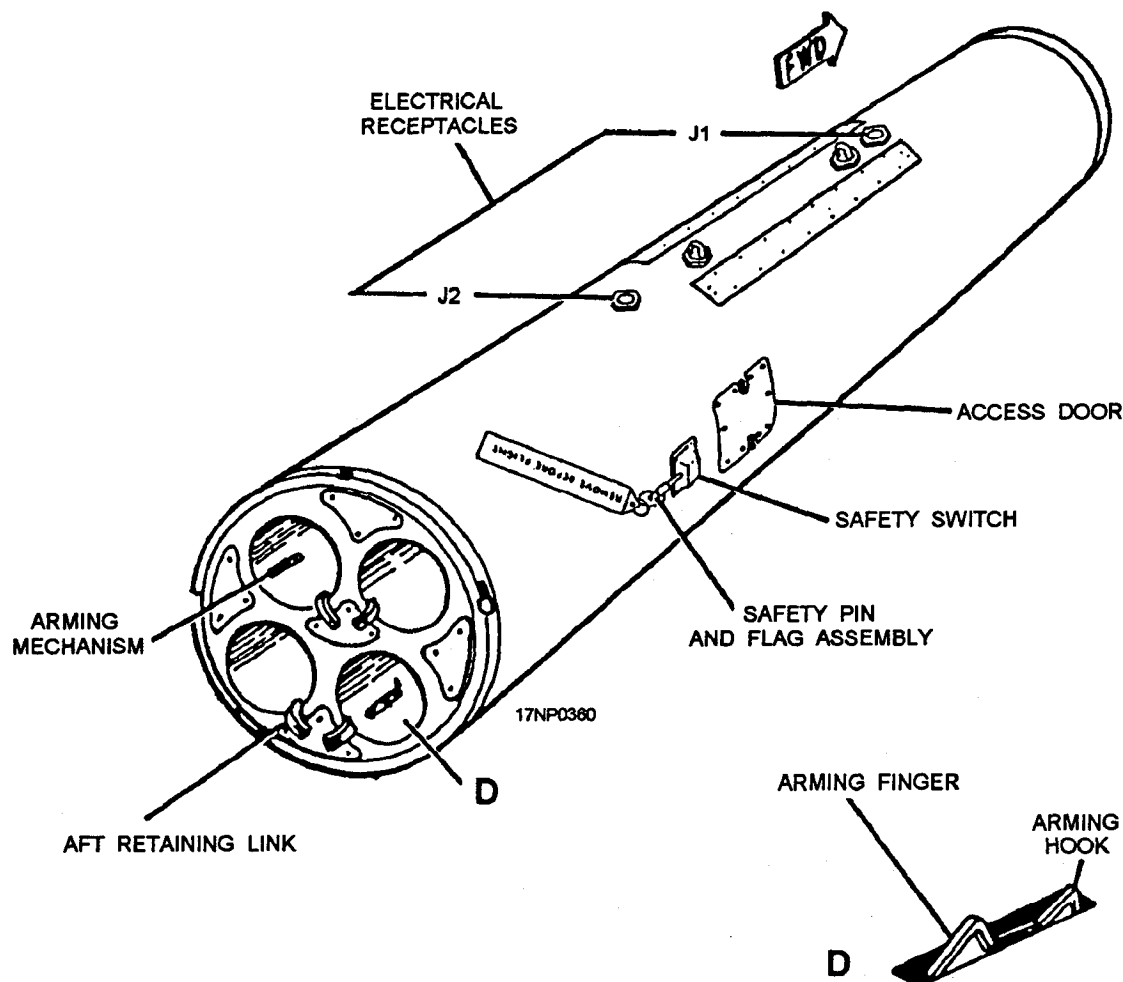


Figure 13-31.—SUU-25F/A.

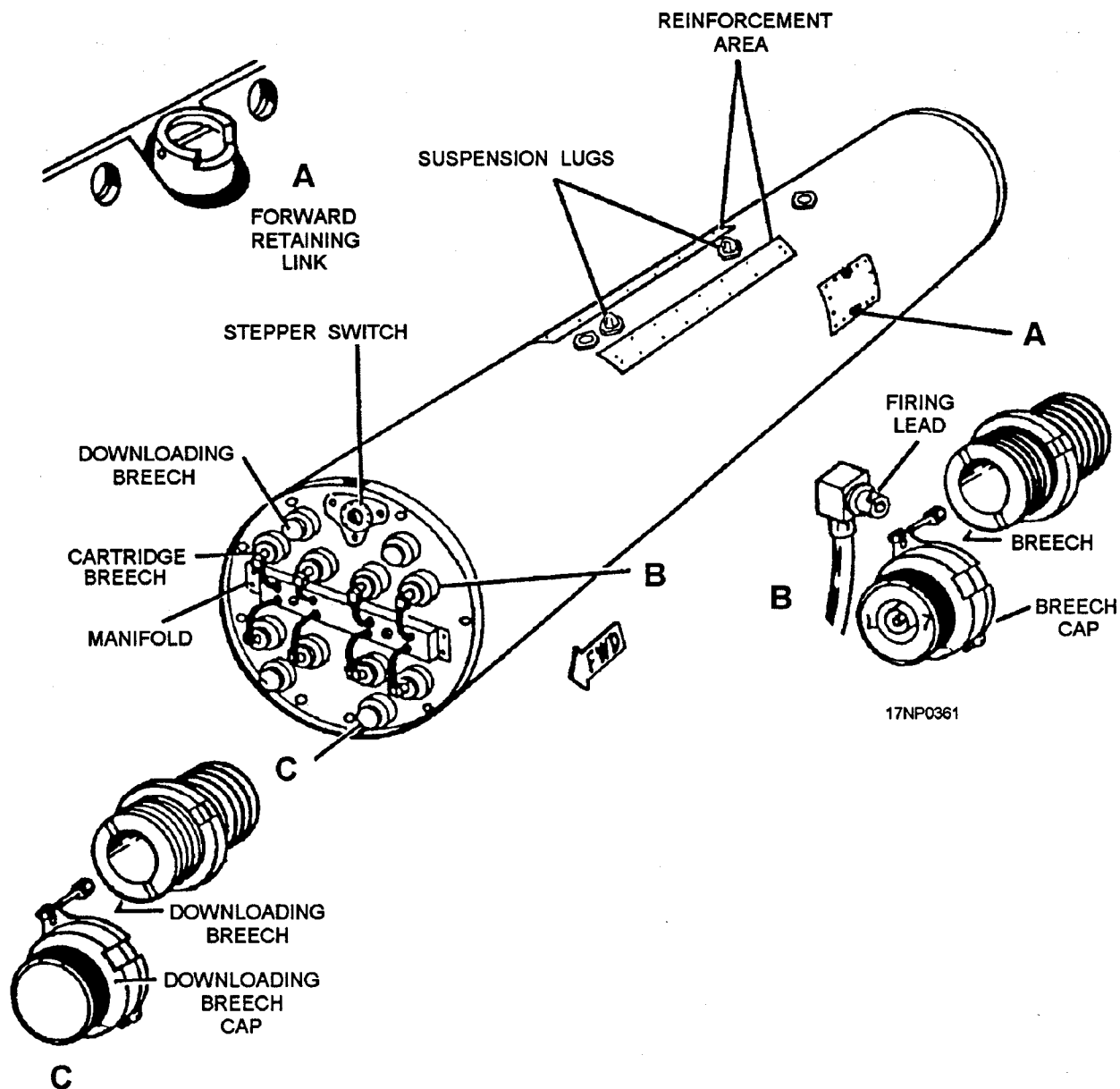


Figure 13-32.—SUU-25F/A downloading breeches.

handling ammunition. These regulations may be general in nature or step-by-step procedures. Regardless of the situation, safety precautions must NEVER be ignored or bypassed, even during the simplest ammunition-handling evolutions.

If you are involved in weapons assembly, always review the applicable safety precautions before beginning the evolution. A few of these general safety precautions are as follows:

1. Fuze or defuze (electric fuzes only) bombs in handling rooms or spaces specifically designed for such purposes.
2. Normally, mechanical nose-fuzed, high-explosive bombs are fuzed after the weapon is loaded

on the aircraft. When the aircraft is carrier based, it must be spotted on the flight deck. Exceptions to this rule are authorized when loading bombs that require special fuzing RADHAZ susceptible units, integral fuzing, and all-up-rounds.

3. Detonators, boosters, primers or other firing devices aren't assembled in or removed from bombs unless specifically prescribed for the weapon.

4. Fuzes aren't allowed to accumulate at the fuzing stations. Never stockpile fuzes. They must be withdrawn from stowage on an as needed basis.

5. Never, under any circumstance, try to disassemble or repair a fuze. Also, never try to render inert a live, loaded item of ordnance.

6. Except as authorized by current directives, no attempt should be made to disarm a fuze.

7. Move assembled rocket ammunition to the designated storage area as soon as practicable after completion of assembly operations.

8. Don't make changes or additions to any ordnance or ordnance components without explicit authority from the Naval Air Systems Command.

9. Exercise particular caution when handling rocket motors to avoid propellant grain damage or fracture.

10. Don't connect electrical power or test equipment to a rocket launcher when rockets are installed.

11. Assemble and fuze airborne rockets in a designated assembly area and as close to the time of aircraft rearming as possible.

